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VOLUME 1

Ithaca, New York
Farmingdale, New York
Albany, New York

DOBBS FERRY UNION FREE SCHOOL DISTRICT

DOBBS FERRY, NEW YORK

PROJECT NO. 234903-20001

RECONSTRUCTION TO

DOBBS FERRY MIDDLE HIGH SCHOOL

SPRINGHURST ELEMENTARY SCHOOL

JULY 2, 2020

The engineer that has signed this document certifies that to the best of their knowledge, information and belief, the asbestos plans and specifications are in accordance with applicable requirements of the New York State Uniform Fire Prevention and Building Code, Construction Standards of the Commissioner of Education, New York State Department of Labor Part 56 of Title 12, and the United States Environmental Protection Agency Hazard Emergency Response ACT Regulations. Christopher M. Schwarz is accredited to the EPA and New York State under AHERA Regulations as an Asbestos Project Designer (Asbestos Handling Certificate Number 08-1979).

To the best of the Architect's knowledge, information and belief, the design of this project conforms to all applicable provisions of the New York State Uniform Fire Prevention and Building Code, the New York State Energy Conservation Code, and the building standards of the New York State Education Department.

SET NO.					

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PLEASE NOTE

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PSVC – One Line Diagram

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All drawings dated July 2, 2020.

NOTICE TO BIDDERS

PUBLIC NOTICE is hereby given that sealed bids will be received by the Dobbs Ferry Union Free School District at the Business Office located at 505 Broadway, Dobbs Ferry, NY 10522 for the Reconstruction to the Dobbs Ferry Springhurst Elementary School and Middle/High School.

Separate Bids are requested for the following Contract(s):

SES-1 (GC) General Construction	MHS-1 (GC) General Construction
SES-2 (SC) Site Work Construction	MHS-2 (RC) Roofing Construction
	MHS-3 (MC) Mechanical Construction
	MHS-4 (EC) Electrical Construction

The bids shall be in accordance with the Specifications, Drawings and Terms of the proposed Contract. All Proposals shall be enclosed in a sealed envelope bearing the name and address of the Bidder, addressed to Ron Clamser, Jr., Assistant Superintendent for Finance, Facilities and Operations, Dobbs Ferry Union Free School District, 505 Broadway, Dobbs Ferry, NY 10522, and endorsed "Reconstruction to the Dobbs Ferry Springhurst Elementary School and Middle/High School" until 4:00 PM prevailing time on April 12, 2021 and immediately thereafter the bids will be publicly opened and read aloud in the said office. No proposals will be accepted after said time and date.

OBTAINING DOCUMENTS

The Contract Documents, including Drawings and Specifications, may be viewed after **10:00 AM on March 15**, **2021**. A link to the FTP site for free downloading PDF files of the contract documents will be available to bidders upon email request to the Construction Manager, Calgi Construction Company, Inc. Attention: Mr. David Chen Email: dchen@calgiconstruction.com. If you would like to purchase hard copy sets of the plans and/or specifications please contact the printer for this project. Plans4Less.com Email: plans@plans4less.com Phone: 855-752-6745 Attn. Brian Burke.

BID SUBMISSIONS

Bids shall be made on the Proposal forms furnished with the Specifications, and must be accompanied by a Bid Bond acceptable by the **District**, in the amount of not less than 5% of the total amount of the Bid. Bidders who submit certified checks must accompany them with a Consent of Surety from a recognized Bonding Company. Checks shall be made payable to the **Dobbs Ferry Union Free School District** to be held by the **District** as a guarantee for the proper execution and delivery of the Contract, Insurance and bonds to secure the faithful performance thereof. In default of such execution and delivery of Contract, Insurance and Bonds, the amount of the deposit represented by the check shall be forfeited and retained by the District as liquidated damages. No Bidder shall withdraw his bid within **sixty days (60)** after the formal opening thereof.

The Owner reserves the right to waive any informality in any proposals, or to reject any or all proposals and to advertise for new proposals. The accepted low bidder(s) will be required to furnish a 100% Performance Bond and a 100% Labor and Material Payment Bond.

Pre-Bid Meeting

A Pre-bid meeting is scheduled for March 24, 2021 at 1:00 PM at the Springhurst Elementary School site Main entrance, 175 Walgrove Avenue, Dobbs Ferry, NY 10522 and 3:00 PM at Middle/High School site HS Gym entrance, 505 Broadway, Dobbs Ferry, NY 10522. Attendance for this meeting is highly recommended for all bidders. For all attending the meeting, please fill out the attestation and sign in with security. If you'd like to do the attestation prior to arriving, please see the link below.

Attestation Link: https://entry.neric.org/dobbsferryschools

Dated: March 15, 2021 By: Ron Clamser, Jr.

Asst. Superintendent for Finance, Facilities and Operations

DOCUMENT 00 21 13- INSTRUCTIONS TO BIDDERS

- 1. <u>DOCUMENTS</u>: Complete sets of Bidding Documents will be issued for bidding purposes as stated in the "Notice to Bidders". A complete set of Bidding Documents consists of the following:
 - a. A bound copy of the Specifications.
 - b. Addenda (if any).
 - c. Contract Drawings.
- 2. <u>BID PROPOSALS</u>: To be considered, bids must be in accordance with these Instructions to Bidders. All bids must be submitted on the prescribed forms as included herein and as bound in the Specifications titled as: Bid Proposal. All blank spaces for bid prices must be filled in, in both words and figures, either typed or in ink.

Bid Proposals that contain any omissions, erasures, alterations, additions, or items not called for in the itemized Bid Proposal, or that contains irregularities of any kind, may constitute sufficient cause for rejection of the bid. In case of any discrepancy between words and figures in the price bid, the price as expressed in words shall govern. All bids must be submitted in sealed envelopes addressed to: Ron Clamser, Jr., Assistant Superintendent for Finance, Facilities and Operations, Dobbs Ferry Union Free School District, 505 Broadway, Dobbs Ferry, NY 10522 and be clearly identified with: (1) Project Name, (2) Name of Bidder, (3) Bidder's address and (4) Contract Number being bid upon. All Bids are to be delivered to: Dobbs Ferry Union Free School District, 505 Broadway, Dobbs Ferry, NY 10522 no later than 4:00 pm, Monday, April 12, 2021 and immediately thereafter the bids will be publicly opened and read aloud in the said office. Any bids received after that time will not be accepted. Bid Proposals shall be signed with the name typed or printed legibly below the signature. The Bidder's seal, if a corporation, shall be affixed under the Bidder's signature. Telephone or telegraphic bids will not be accepted.

If separate sets of Bid Proposal sheets are issued, they may be used with the understanding that all instructions and conditions of the Contract Documents are the same as if these pages were bound therein.

PREPARATION OF BID PROPOSAL

- A. Bid Proposals must be submitted upon the prescribed form, one copy of which is attached hereto. All blank spaces for bid prices must be filled in, in ink, in both words and figures. The Bidder shall submit as their bid one copy of the Bid Proposal Form, and keep a copy for their records. Bid Proposals shall consist of the following, filled-in and executed:
 - I. Bid Security
 - II. Bid Proposal Form
 - III. References
 - IV. Bid Proposal Certifications (Non-Collusive Form and General Municipal Law §103-g(4) Form)
 - V. Statement of Bidder's Qualifications
 - VI. Letter from Insurance Carrier certifying that Contractor meets Insurance Requirements as per bid specifications-Contractor Insurance requirements are as noted in General Conditions, Article 11 Insurance & Bonds and Supplementary General Conditions, Section 006020.
 - VII. Certified letter from Bonding Company, indicating that they meet the minimum requirement required by the contract to be awarded and stating that it will provide the necessary Performance Bond and Labor and Material Payment Bond for the project being bid.

All bids must be submitted in sealed envelopes, bearing on the outside, the name of the Bidder, their address, the name of the project and Contract Number bid upon. Bid Proposals so enclosed shall be delivered on or before the date, time and at location stipulated above.

3. <u>QUALIFICATIONS OF BIDDERS</u>: The **Dobbs Ferry Union Free School District, hereinafter referred to as the "District"** may make such investigations as it deems necessary to determine the qualifications of the Bidder to perform the work, and the Bidder shall furnish information and data for this purpose as is required (see Statement of Bidders Qualifications). The **District** reserves the right to reject any bid if the evidence submitted by a Bidder, or the investigation of such Bidder, fails to satisfy the **District** that such Bidder is properly qualified to carry out the obligations of the contract to be awarded and to complete the work contemplated therein within the time designated. Fraudulent statements shall cause rejection of the subject bid and forfeiture of the related bid security.

To be considered qualified, a Bidder must demonstrate to the **District's** satisfaction:

- I. The Corporation, partnership, sole proprietorship or other business entity in whose name bid is submitted has been in business, continuously, for no less than the previous five (5) years performing or coordinating the Work which they are bidding on.
- II. The Bidder has satisfactorily completed no less than five (5) projects of comparable size and complexity to this project as a Prime Contractor to a Project Owner.
- III. The Bidder is not currently involved in bankruptcy proceedings.
- IV. The Bidder is licensed to perform the Work they are bidding on in the jurisdiction in which the Work will take place.
- V. The Bidder is capable of and intends to perform at least 25% of the Work with their own forces.
- VI. The Bidder is able to perform the Work with the manpower available to them.
- VII. The Bidder and each of its sub-contractors must have five (5) years' experience in the Work and/or applicable trade.
- VIII. The successful Bidder's Field Superintendent must have at least five (5) years as a working field superintendent. The Field Superintendent shall speak fluent English or the successful Bidder shall supply an interpreter to be at the project site whenever the Field Superintendent is there at no additional cost to the District.
- 4. <u>CONDITIONS OF WORK</u>: Each Bidder must inform themselves fully of all conditions under which the work will be performed. Failure to do so will not relieve a successful Bidder of its obligation to furnish all material and labor necessary to carry out the provisions of the contract to be awarded and to complete the work for the consideration set forth in its bid. Each Bidder's attention is directed to Paragraph 1 of the Bid Proposal, in which the Bidder certifies that they have examined the site. The Bid Proposal shall include the complete costs of furnishing all materials, labor and equipment necessary to complete the work in accordance with the Contract Plans and Specifications and all other expenses incidental thereto. Local and State sales taxes shall not be included in the bid. Insofar as possible, the successful Bidder, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor, or of the proper functioning of the existing facilities of adjacent or contiguous properties, and shall be maintained insofar as possible.

5. ADDENDA AND INTERPRETATION:

- a. **ADDENDA:** Additions or deletions to the scope of work and supplemental Instructions to Bidders may be issued by the **District** in the form of an ADDENDUM.
- b. REQUESTS FOR INFORMATION AND INTERPRETATIONS: Every request for information or interpretation of Specifications, Addenda, or Contract Drawings must be addressed in writing using the enclosed form in the Specifications (Section 002113) and emailed to the Construction Manager, Calgi Construction Company, Inc. Email dchen@calgiconstruction.com Attention: Mr. David Chen and Tetra Tech Architects and Engineers at INE.Dobbsferry@tetratch.com
 - To be given any consideration, all requests for information or interpretation must be received at least **seven** (7) business days prior to the date fixed for the opening of bids. Any and all such interpretations, and any supplemental instructions, will be issued in the form of written Addenda and will be E-Mailed to all prospective Bidders. The failure of any Bidder to receive any such Addenda will not relieve the Bidder of any obligation under his Bid as submitted. Any Addenda so issued shall become part of the Bidding Documents. Receipt of Addenda shall be noted on the "Bid Proposal Form."
- 6. <u>BID SECURITY</u>: Each Bidder is required to deposit, at the time of submission of their bid, a Bid Bond or certified check in an amount representing five (5%) percent of their bid, payable to **Dobbs Ferry Union Free School District**, which amount the Bidder agrees is to be forfeited as liquidated damages and not as a penalty if the Bidder is awarded the contract and thereafter fails to execute a contract with the **Dobbs Ferry Union Free District** under the conditions of the Bidding Documents or to furnish the bonds required for the faithful performance of the awarded contract. Bidders who submit certified checks must accompany them with a Consent of Surety from a recognized bonding company agreeing to supply a Performance Bond and Labor and Materials Bond if the contract is awarded to the Bidder.

Such bid security will be returned to all except the three lowest formal Bidders within three days after the formal opening of bids, and the remaining bid security will be returned to the other Bidders after the **District** and the accepted Bidder have executed a contract. In the event no contract has been so executed within SIXTY (60) calendar days after the date of the opening of bids, upon the demand of the Bidder, so long as Bidder has not been notified of the acceptance of its bid, Bidder's security will be returned. The Bid Security of the successful Bidder will be retained until the signing of the awarded contract and the filing and approval of the bonds and insurance certificates.

- 7. <u>INSURANCE REQUIRED</u>: The successful Bidder will be required to procure and pay for the following types of insurance. Contractor Insurance requirements are as noted in General Conditions, Article 11 Insurance & Bonds and Supplementary General Conditions, Section 006020.
 - a. Commercial General Liability
 - b. Statutory Workers Compensation
 - c. Commercial Automobile Liability
 - d. Umbrella Liability/Excess Liability
 - e. Contractors Pollution Liability

8. SECURITY FOR FAITHFUL PERFORMANCE: The successful Bidder shall, prior to execution of the awarded contract, submit executed bonds: (1) a Performance Bond in amount equal to one hundred percent (100%) of the accepted bid as security for the faithful performance of the terms, covenants and conditions of the awarded contract; and (2) a Labor and Materials Payment Bond for the full amount of the awarded contract price guaranteeing the full payment of all persons performing labor or furnishing materials or rentals under the awarded contract.

In addition, at the time of final payment, a two year (2) Maintenance Bond guaranteeing against defective materials and workmanship will be required in an amount equal to one hundred percent (100%) of the adjusted contract amount. This Bond in no way removes the obligation of the successful Bidder to comply with furnishing the standard one (1) year guarantee / warranty as specified elsewhere in the Specifications.

The Bonds shall be prepared on standard AIA forms as follows: Performance Bond and Payment Bond shall be in accordance with the latest A.I.A. Document A-312. Bonds shall have as Surety thereon such Surety Company or companies as are acceptable to the **District** and are authorized to transact business in the State of New York.

All Bonding companies supplying bid, performance, payment and maintenance bonds are required to provide, with the bid package, the following required information. Bidders failing to provide this information will not be considered. Provide a certified statement that the bonding company meets or exceeds the following:

- 1. A.M. Best Company (Old Wick, New Jersey) Rating of A or better.
- 2. (FPR) Financial Performance Rating from A.M. Best of not less than VI.
- 3. Bonding Company must be registered to do business in New York State.
- 4. Listed in the U.S. Treasury Circular 570 (1994 or current version).
- 5. If underwriting limitation is less than the required performance bond amount, then the excess amount must be protected by co-insurance with a company meeting the same standards as above.
- 9. <u>FORM OF AGREEMENT</u>: The form of agreement shall be the **Standard Form of Agreement Between Owner and Contractor,** Construction Manager as Advisor Edition, AIA Document A132- 2009, modified to conform to the Bidding Documents.

10.<u>AWARD</u>:

- a) Contract award will be made to the lowest responsible Bidder to be determined at the **District's** discretion as follows:
 - i. If the award is to be made on the basis of Base Bid only, it may be made to that responsible Bidder whose Base Bid therefore is the lowest.
 - ii. If the award is to be made on the basis of a combination of Base Bids with Alternates, it may be made to that responsible Bidder, whose net bid on such combination is the lowest, using such Alternates as selected by the Owner.
- b) The **District** reserves the discretionary right to waive what it deems to be informalities relating to a specific bid, to waive what it deems to be technical defects, irregularities and omissions relating to a specific bid, and to request additional information from any Bidder.

- c) The **District** reserves the discretionary right to reject any or all bids within sixty (60) days of bid opening, if in its opinion the best interest of the District will thereby be promoted, and to advertise for new bids.
- 11. OWNER: Dobbs Ferry Union Free School District, Dobbs Ferry, New York.
- 12. <u>SALES TAX EXEMPTION</u>: Under Chapter 513 of the Laws of New York 1974, all materials and supplies sold to a contractor and which are to become an integral, component part of a structure, building or real property owned by an exempt organization such as the **District** are exempt from the payment of New York State Sales and Compensatory Use taxes. Therefore, Bidders should not include any amount in their bid price to cover sales taxes for the above items.
- 13. <u>REQUIRED SUBMISSIONS</u>: Prior to award, the successful Bidder will be required to meet the following requirements:
 - a. The successful Bidder, if their business is not registered in New York State, must provide the **District** with a certificate issued by the Secretary of State of New York stating that the Corporation is authorized to do business within the State and is presently in good standing. If the entity to whom the bid is awarded is not a corporation, it would be required that the entity's certificate of doing business, which should be on file in the County Clerk's Office, Westchester County, be provided. (This would also hold true in the case of joint ventures which would be required to disclose the underlying entities which make up the joint venture and the supplying of the requisite certificate of doing business of each such entity.)
 - b. A statement by the successful Bidder that no officer, director or stockholder of the successful Bidder is an officer or employee of the **District** or is a relative of any such **District** officer or employee. If such officer, director or stockholder does exist, their names and relationship shall be disclosed to the **District**.
 - c. The successful Bidder shall submit the following, in a form acceptable to the **District**, for approval before being permitted to start work:
 - i. Signed Contract
 - ii. Certificates of Insurance
 - iii. Labor and Material Payment Bond
 - iv. Performance Bond
 - v. Schedule of Values*
 - vi. Construction Schedule
 - vii. Submittal Schedule

*The Schedule of Values included as part of the Bid Proposal is for the purpose of bid evaluation only. The Schedule of Values referenced here as item v. is the one that will accompany the Contractor's Payment Requisition form and must be reviewed and approved by the Architect and Construction Manager before the first payment requisition is submitted.

- 14. APPRENTICES PROGRAM: Not Applicable
- 15. <u>AFFIRMATIVE ACTION REQUIREMENTS</u>: The Bidder agrees and warrants that in the performance of the contract to be awarded, the Bidder will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, disability, age, sex, religion or national origin in any manner prohibited by the laws of the United States, New York State, County of Westchester and further agrees to provide any information that may be requested by the **District** or it's Consultants or any Governmental Agency concerning practices and procedures of the Bidder as related to the provisions of this section.

- 16. <u>CERTIFIED PAYROLL</u>: The successful Bidder will be required to submit a certified payroll certificate with each monthly payment requisition.
- 17. SITE SUPERVISION: THE SUCCESSFUL BIDDER IS TO PROVIDE FULL TIME SITE SUPERVISION FOR HIS OR HER STAFF, SUBCONTRACTORS AND SUPPLIERS FOR THE DURATION OF THIS PROJECT. A competent superintendent shall be in attendance at the job site at all times when work is being performed under the contract to be awarded. A qualified site superintendent must have the authority to represent and make decisions for his or her company with regards to the subject job, must be able to give guidance and direction to employees, subcontractors and suppliers, and must be knowledgeable about the work to be provided. FAILURE TO PROVIDE A QUALIFIED SITE SUPERINTENDENT AT THE JOB SITE SHALL SUBJECT THE SUCCESSFUL BIDDER TO A PENALTY OF \$500 PER DAY FOR EVERY OCCURRENCE.
- 18. <u>LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE THE PROJECT ON TIME:</u> By submitting a Bid Proposal, Bidders recognize and agree that time is of the essence on the contract to be awarded and the date of Substantial Completion shall be no later than the date indicated in the Contract Documents. In the event the successful Bidder fails to substantially complete the work under the awarded contract by said scheduled date, each Bidder agrees liquidated damages of \$1,000.00 per calendar day will be subtracted from the payment due the successful Bidder as follows:

Liquidated damages of \$1,000.00 per day beginning on the fifth calendar day <u>after</u> the substantial completion dates listed, except in cases where a delay is due to unforeseeable causes beyond the control and without the fault or negligence of the successful Bidder including, acts of God, or of a public enemy, acts of the Government, in either its sovereign or contractual capacity, fire, floods, epidemics, quarantine restrictions, strikes, freight embargoes, or delays of Subcontractors or Suppliers due to such causes. Delay in acquisition of materials other than by reason of strike or freight embargoes will not constitute a delay excusable under this provision unless approved by the **District** in writing.

Within five calendar days from the occurrence of any such delay, the successful Bidder shall notify the **District** in writing of the cause of delay. The **District** will ascertain the facts and extent of the delay, and extend the time for completing the Work when in the judgment of the **District's** Architect and Construction Manager the findings of fact justify such an extension. The **District's** findings of fact will be final and binding.

The said sum of \$1,000.00 per calendar day shall constitute the Liquidated Damages incurred by the **District** for each day of delay beyond the agreed upon dates of substantial completion. Such Liquidated Damages shall be in addition to any other damages, other than by reason of delay, which the **District** may incur as a result of the successful Bidder's breach of contract.

In the event the successful Bidder fails to complete all work under the awarded contact by said scheduled dates and the District has taken occupancy, the successful Bidder will not be permitted to perform any work during normal business hours. Such work shall only be performed after the District's business hours, Saturdays, Sundays, holidays or periods when the facility is unoccupied, and at no additional cost to the Owner.

In addition to Liquidated Damages, the successful Bidder shall be liable for all additional costs incurred by the District to: provide staff required to make the facility accessible to the successful Bidder, the Architect, their Consultants and the Construction Manager as required to perform inspections after the completion date of the awarded contract. (Inspections will be performed on a regular basis, during construction by the Architect, their Consultants and Construction Manager. The same schedule will be followed in the event that the completion date of the awarded contract is not met, unless the District, their Architect and Construction Manager determine, at their sole discretion, that additional inspections are needed.)

All costs incurred by the District, and the cost of additional Architectural and Construction Manager inspections, will be subtracted from payment due the successful Bidder (or, if the amount due the successful Bidder for payment is insufficient, any deficiency shall be paid by the successful Bidder to the District.

19. OBLIGATION OF BIDDERS:

- A. At the time of the opening of bids, each Bidder will be presumed to have inspected the site and to have examined and to be thoroughly familiar with the Contract Drawings, General Conditions, General Requirements of the contract to be awarded, and Specifications (including all Addenda thereto). Each Bidder will also be presumed to be familiar with the scope and schedule of other projects that maybe concurrently scheduled at the project site. The failure of or omission of any Bidder to receive or examine any Contract Drawings, form, instruction or document shall in no way relieve any Bidder from any obligation in respect to its bid.
- B. Each Bidder shall, by careful examination of the site, satisfy themselves as to the location of the work, the character, the quality and quantity of the work to be performed and materials to be furnished, the character of equipment and facilities needed preliminary to and during prosecution of the work, the general and local conditions and all other matters which in any way affect the work specified in the Contract Documents.
- C. After the contract has been awarded, no consideration will be given for any misunderstanding as to the work and materials set forth in the Contract Documents and shown on any of the accompanying Contract Drawings, details or schedules, it being mutually understood that the tender of a bid carries with it an agreement to this and other obligations set forth in the Contract Documents, including but not limited to Specifications, Contract Drawings and details, noted indications and requirements.
- D. Each Bidder should review the State of New York Department of Labor Schedules of the prevailing hourly wage rates, the prevailing hourly supplements, and the requirements for all Contractors and Subcontractors engaged on public work projects in New York State.
- E. It is the intention of the Contract Documents, including but not limited to Specifications and Contract Drawings, to provide for a complete, key-in- lock job under each particular prime contract. The bid should therefore include all items of labor and materials, including all patching and repair work necessary even though such items may not be specifically noted to complete finished job.
- F. During the bidding and construction process, each Bidder is responsible for reading all Contract Drawings and all Specification sections and performing any work which falls under the Bidder's trade. Each Bidder is also responsible to be familiar with the Contract Drawings and Specifications of the work of the other contractors at work on this project.
- 20. <u>RETAINAGE</u>: The successful Bidder's application for payment will be based on a 5% (five percent) retainage. The 5% retainage shall be retained until final acceptance of the project, at which time the retainage shall be released upon submission of required close-out documents.
- 21. <u>SITE INSPECTION</u>: See Notice to Bidders for scheduled pre-bid meeting.
- 22. <u>SUBMITTALS</u>: All long lead items shall be submitted within ten (10) working days of the start of work. Refer to Specifications for additional requirements.

23. <u>DISTRICT'S TIME AND DAMAGE CLAIMS</u>:

A. Any time or expenses incurred by the **District's** Architect, the Architect's Consultants and Construction Manager as a result of the successful Bidder's activities, unless otherwise specifically agreed to in writing by the District, will be back-charged to the successful Bidder. Rates as follows:

	Weekdays: 6:00 am to 6: 00 pm All day Saturday	Sundays, Holidays All day
Architect	\$TBD/hour	\$TBD /hour
Civil Engineer Project Engineer	\$TBD /hour	\$TBD /hour
MEP Engineer Project Engineer	\$TBD/hour	\$TBD/hour
Construction Manager	\$ 135.00 /hour	\$180.00 /hour

B. Any time expenses incurred by the District's maintenance staff as a result of slippage or lack of progress of the contractor's activities, unless otherwise specifically agreed to in writing by the District, will be charged to the Contractor. The rates for the District's maintenance staff shall be as follows:

Standard Hourly Rate	\$TBD/hour	M-F 7am-11pm
Time and a Half	\$TBD/hour	M_F 11pm-7am
Double Time	\$TBD/hour	Saturday and Sunday

- C. Except when deemed an emergency or specialty service (i.e.: fire or security alarm) by the **District**, the successful Bidder will be given written notice concerning required repairs to damages caused by the successful Bidder's activities. If the damages are not corrected to the **District's** satisfaction and per the **District's** time frame, the **District** will make the corrections and back-charge the successful Bidder accordingly via a reduction in the amount of the awarded contract.
- 24. <u>PROJECT CLOSE-OUT INSPECTION PROCEDURES</u>: Upon receipt of a request for an inspection or on the date scheduled for substantial completion, whichever comes first, the Architect and Construction Manager will conduct an inspection and issue a list of all incomplete and/or defective work that must be completed or corrected before a Certificate of Substantial Completion will be issued.

The successful Bidder shall complete all remaining work and punch list items within twenty one (21) calendar days of receipt of the Punch List. Should the successful Bidder fail to complete the work as described herein, the **District** may without further delay, terminate the awarded contract, withhold all further payments, and complete the work to the District's convenience deducting all costs to administer, perform and inspect the completion of the work from the balance due upon the awarded contract.

The Architect and Construction Manager will conduct one re-inspection at the completion of all punch list items, when requested and assured that the Work has been completed by the successful Bidder. If the work has not been completed by the successful Bidder, the cost to perform subsequent inspections by the Architect and Construction Manager will be subtracted from payment due the successful Bidder (or, if the amount due the successful Bidder is insufficient, any deficiency shall be paid by the successful Bidder to the District..

Final acceptance of the work and approval of final payment will occur only after the Architect has conducted an inspection/re-inspection to verify the work is complete and adequate.

END OF SECTION 00 21 13



INSTRUCTIONS TO BIDDERS ATTACHMENT #1: PRE-BID REQUEST FOR INTERPRETATION FORM

SUBMIT FORM BY EMAIL TO

INE.DobbsFerry@tetratech.com and dchen@calgiconstruction.com

Project No.:	234903-20001		Date:
Project Name:	Reconstruction to Dobbs	Ferry Middle/High School and Sp	oringhurst Elementary
Bidder Contac Bidder Compa Bidder Phone: Bidder Email	nny Name: : Address:		
Question Perta			
Drawing Num Plan Area: Room Numbei Drawing Detai	r:		
Specification S	Section:		
Specification S	Section:		
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Specification S	Section:ase be specific)		

DOCUMENT 00 25 13 - PREBID MEETINGS

1.1 PREBID MEETING

- A. Construction Manager will conduct a Prebid meeting as indicated below:
 - 1. Meeting Date: Wednesday, March 24, 2021
 - 2. 1:00 PM Springhurst Elementary School, 175 Walgrove Ave, Dobbs Ferry, N.Y.
 - 3. 3:00 PM Dobbs Ferry Union Free School District, 505 Broadway, Dobbs Ferry, NY.
 - 4. See Notice to Bidders for requirement to fill out a Covid screening attestation before attending.

B. Attendance:

- 1. Prime Bidders: Attendance at Prebid meeting is recommended.
- 2. Subcontractors: Attendance at Prebid meeting is recommended.
- C. Bidder Questions: Submit written questions to be addressed at Prebid meeting minimum of two business days prior to meeting.
- D. Agenda: Prebid meeting agenda will include review of topics that may affect proper preparation and submittal of bids, including the following:
 - 1. Procurement and Contracting Requirements:
 - a. Advertisement for Bids.
 - b. Instructions to Bidders.
 - c. Bidder Qualifications.
 - d. Bonding.
 - e. Insurance.
 - f. Bid Security.
 - g. Bid Form and Attachments.
 - h. Bid Submittal Requirements.
 - i. Bid Submittal Checklist.
 - j. Notice of Award.
 - 2. Communication during Bidding Period:
 - a. Obtaining documents.
 - b. Bidder's Requests for Information.
 - c. Bidder's Substitution Request/Prior Approval Request.
 - d. Addenda.
 - 3. Contracting Requirements:
 - a. Agreement.
 - b. The General Conditions.
 - c. The Supplementary Conditions.
 - d. Other Owner requirements.

- 4. Construction Documents:
 - a. Scopes of Work.
 - b. Temporary Facilities.
 - c. Use of Site.
 - d. Work Restrictions.
 - e. Alternates, Allowances, and Unit Prices.
 - f. Substitutions following award.
- 5. Schedule:
 - a. Project Schedule.
 - b. Contract Time.
 - c. Liquidated Damages.
 - d. Other Bidder Questions.
- 6. Site/facility visit or walkthrough.
- 7. Post-Meeting Addendum.
- E. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes to attendees. Minutes of meeting are issued as Available Information and do not constitute a modification to the Procurement and Contracting Documents. Modifications to the Procurement and Contracting Documents are issued by written Addendum only.
 - 1. Sign-in Sheet: Minutes will include list of meeting attendees.
 - 2. List of Plan-holders: Minutes will include list of plan-holders.

END OF DOCUMENT 00 25 13



10 Brown Road Ithaca, New York 14850 (607) 277-7100

Ithaca, New York Farmingdale, New York Albany, New York

ID FROM (Bidder's Name)	:	
` ,		
Bidder's Telephone	:	
Bidder's Facsimile (Fax)	:	
Bidder's E-mail Address	:	

BID FORM (submit in duplicate)

CONTRACT: SES-1 (GC) GENERAL CONSTRUCTION

PROJECT TITLE: RECONSTRUCTION TO SPRINGHURST ELEMENTARY SCHOOL

DATE: JULY 2, 2020

PROJECT NO.: 234903-20001

BID TO: Board of Education

Dobbs Ferry Union Free School District

505 Broadway

Dobbs Ferry, New York 10522

The Bidder hereby certifies that it has examined and fully understands the requirements and intent of the Bidding Documents, including the Bidding Requirements and proposed Contract Documents; and proposes to furnish all labor, materials, and equipment necessary to complete the Work on, or before, the dates specified in the Contract Documents for the **BASE BID** sum of:

(words)	
	(\$
	(figures)

Show all amounts in both words and figures; in the event of a discrepancy between amounts written in words and figures, the amount written in words shall govern.

Refer to Division 01 Section "Allowances" for description of allowances to be included in the Base Bid above.

LIST OF ADDENDA RECEIVED No. _____ Date_____ No. _____ Date ____ No. _____ Date No. _____ Date _____ No. _____ Date_____ No. _____ Date ____ **BID ATTACHMENTS** Enclosed with this Bid are the following attachments:

Attachment #1 - Non-Collusive Bidding Certification.

Attachment #2 - Certified Corporate Resolution.

Attachment #3 – Iranian Energy Divestment Certification

Attachment #4 – Certification on Violations

BID SECURITY

Enclosed with this Bid is bid security in the amount of five percent of the Base Bid.

EXECUTION OF CONTRACT

If written notice of the acceptance of this Bid is transmitted to the undersigned within 45 days following the Bid opening, the undersigned will, within 10 days following the Notice of Award, execute and transmit a Contract in the form as required by the Architect.

This Bid may be withdrawn at any time prior to the Bid opening.

SIGNATURE

()	NAME OF BIDDER (Corporate Name)
(Corporate Seal)	SIGNATURE (Corporate Officer)
()	
()	DATE:

GENERAL CONDITIONS TO BID NON-COLLUSIVE BIDDING CERTIFICATION

No bid will be accepted that does not have this form completely executed.

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:

- (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 any competitor;
- (b) 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;
- (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;
- (d) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in its behalf;
- (e) That attached hereto (if corporate bidder) is a certified copy of resolution authorizing the execution of this certified by the signature of this bid or proposal in behalf of the corporate bidder.

		(Individual)	
		(Corporation)	
		• • •	
Dated:	By		
		(Signature of Officer)	

This Non-Collusive Bidding Certificate must be submitted with the bid.

CERTIFIED CORPORATE RESOLUTION

RESOLVED THAT	be authorized to sign and submit the bid or ject:
three-d (103-d) of the general municipal law as	cate as to non-collusion required by section one hundred s to the act and deed of such corporation, and for any this corporate bidder shall be liable under the penalties of
The foregoing is a true and correct copy of the res	solution and adopted by
	at a meeting of its board of directors held on the
day of	20
	(Secretary)

IRANIAN ENERGY DIVESTMENT CERTIFICATION

Pursuant to Section 103-g Of the New York State General Municipal Law

- A. By submission of this bid/proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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 New York State Finance Law.
- B. A Bid/Proposal shall not be considered for award, nor shall any award be made where the condition set forth in Paragraph A above has not been complied with; provided, however, that in any case the bidder/proposer cannot make the foregoing certification set forth in Paragraph A above, the bidder/proposer shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where Paragraph A above cannot be complied with, the Purchasing Unit to the political subdivision, public department, agency or official thereof to which the bid/proposal is made, or his designee, may award a bid/proposal, on a case by case business under the following circumstances:
 - 1. The investment activities in Iran were made before April 12, 2012, the investment activities in Iran have not been expanded or renewed after April 12, 2012, and the Bidder/Proposer has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or
 - 2. The political subdivision makes a determination that the goods or services are necessary for the political subdivision to perform its functions and that, absent such an exemption, the political subdivision would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

	Signature	
	Title	
Date	Company	

CERTIFICATION ON VIOLATIONS

	t, to the best of his or her known	sentative of	, hereby sw	years to and certifies
ша	it, to the dest of his or her know	viedge and benef:		
1.	Neither the "Bidder"), has been found Copeland Act pursuant to 18 Standards Act pursuant to 40	U.S.C. 874 and 40 U.S.C. U.S.C. 332, or their New	avis-Bacon Act pursuar . 3145 or the Contract	nt to 40 U.S.C. 3144, the Work Hours and Safety
	True	False		
	If False is selected, informati 2 and 3 are not applicable, co		nust be provided. If Tru	ie is selected questions
2.	If the Bidder has been found Work Hours and Safety Standagency, the date of the violating warnings, fines and	lards Act, or any of their Ne ation, the nature of the vio	ew York State counterpa	arts, state the name of the
3.	The Bidder is not currently Bidder is under investigation, of the alleged violation below	state the name of the agenc		
•				
4.	The Bidder's Dun & Bradstre	eet D-U-N-S number is		
5.	I have authority to execute this	is certification, knowing it	will be relied upon by th	ne Owner of this Project.
	Name	Ti	tle	
Sw	orn to before me this	day of	,	20
No	tary Public			



10 Brown Road Ithaca, New York 14850 (607) 277-7100

Ithaca, New York Farmingdale, New York Albany, New York

ID FROM (Bidder's Name)	:	
` ,		
Bidder's Telephone	:	
Bidder's Facsimile (Fax)	:	
Bidder's E-mail Address	:	
(if applicable)		

BID FORM (submit in duplicate)

CONTRACT: SES-2 (SC) SITE WORK CONSTRUCTION

PROJECT TITLE: RECONSTRUCTION TO SPRINGHURST ELEMENTARY SCHOOL

DATE: JULY 2, 2020

PROJECT NO.: 234903-20001

BID TO: Board of Education

Dobbs Ferry Union Free School District

505 Broadway

Dobbs Ferry, New York 10522

The Bidder hereby certifies that it has examined and fully understands the requirements and intent of the Bidding Documents, including the Bidding Requirements and proposed Contract Documents; and proposes to furnish all labor, materials, and equipment necessary to complete the Work on, or before, the dates specified in the Contract Documents for the **BASE BID** sum of:

(words)			
	(\$	(figures)	

Show all amounts in both words and figures; in the event of a discrepancy between amounts written in words and figures, the amount written in words shall govern.

Refer to Division 01 Section "Allowances" for description of allowances to be included in the Base Bid above.

ALTERNATES

Indicate in the spaces provided below the amount to be added to or the amount to be deducted from (as applicable) the Base Bid if the Owner accepts the following Alternates described in Division 01 Section "Alternates".

Include in the amount of each Alternate, all labor, materials, overhead and profit, modification of Work specified in the Contract Documents, and additional work that may be required by acceptance of the Alternate.

ALTERNATE No. SES-1 – SITE LIGHTING AT SPRING	HURST ELEME	NTARY SCHOOL	
ADD to the Base Bid the sum of:			
	(\$)
(words)	. ,	(figures)	
OR			
DEDUCT from the Base Bid the sum of:			
	(\$)
(words)	(\$	(figures)	/

UNIT PRICES

Refer to Division 01 Section "Unit Prices" for description of unit prices.

Unit Price 1: Trench Rock Excavation Unit of Measure: Per Cubic Yard			
Cost per Unit:	/ Φ		`
(words)	(\$	(figures))
Unit Price 2: Bulk Rock Excavation			
Unit of Measure: Per Cubic Yard			
Cost per Unit:			
(words)	(\$	(figures))
Unit Price 3: Concrete Slab-On-Grade			
Unit of Measure: Per Square Foot			
Cost per Unit:	(4)		,
(words)	(\$	(figures))
Unit Price 4: Replacement of Unsuitable On-Site Material			
Unit of Measure: Per Cubic Yard			
Cost per Unit:			
	(\$)
(words)		(figures)	

LIST OF ADDENDA RECEIVED

No	Date	No	Date
No	Date	No	Date
No.	Date	No.	Date

BID ATTACHMENTS

Enclosed with this Bid are the following attachments:

Attachment #1 - Non-Collusive Bidding Certification.

Attachment #2 - Certified Corporate Resolution.

Attachment #3 – Iranian Energy Divestment Certification

Attachment #4 – Certification on Violations

BID SECURITY

Enclosed with this Bid is bid security in the amount of five percent of the Base Bid.

EXECUTION OF CONTRACT

If written notice of the acceptance of this Bid is transmitted to the undersigned within 45 days following the Bid opening, the undersigned will, within 10 days following the Notice of Award, execute and transmit a Contract in the form as required by the Architect.

This Bid may be withdrawn at any time prior to the Bid opening.

SIGNATURE

()	NAME OF BIDDER (Corporate Name)
(((Corporate Seal)))	SIGNATURE (Corporate Officer)
())	
()	DATE:

GENERAL CONDITIONS TO BID NON-COLLUSIVE BIDDING CERTIFICATION

No bid will be accepted that does not have this form completely executed.

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:

- (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 any competitor;
- (b) 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;
- (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;
- (d) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in its behalf;
- (e) That attached hereto (if corporate bidder) is a certified copy of resolution authorizing the execution of this certified by the signature of this bid or proposal in behalf of the corporate bidder.

		(Individual)	_
			_
		(Corporation)	
5	.		
Dated:	By		_
		(Signature of Officer)	

This Non-Collusive Bidding Certificate must be submitted with the bid.

CERTIFIED CORPORATE RESOLUTION

RESOLVED THAT	ntion for the following p	be authorized to sign and submit the b	bid or
proposal of this corpora	ation for the following p	project:	
three-d (103-d) of the	general municipal law	tificate as to non-collusion required by section one hum as to the act and deed of such corporation, and for ate this corporate bidder shall be liable under the penalt	r any
The foregoing is a true	and correct copy of the	resolution and adopted by	
		at a meeting of its board of directors held or	n the
	day of	20	
		(Secretary)	

IRANIAN ENERGY DIVESTMENT CERTIFICATION

Pursuant to Section 103-g Of the New York State General Municipal Law

- A. By submission of this bid/proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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 New York State Finance Law.
- B. A Bid/Proposal shall not be considered for award, nor shall any award be made where the condition set forth in Paragraph A above has not been complied with; provided, however, that in any case the bidder/proposer cannot make the foregoing certification set forth in Paragraph A above, the bidder/proposer shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where Paragraph A above cannot be complied with, the Purchasing Unit to the political subdivision, public department, agency or official thereof to which the bid/proposal is made, or his designee, may award a bid/proposal, on a case by case business under the following circumstances:
 - 1. The investment activities in Iran were made before April 12, 2012, the investment activities in Iran have not been expanded or renewed after April 12, 2012, and the Bidder/Proposer has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or
 - 2. The political subdivision makes a determination that the goods or services are necessary for the political subdivision to perform its functions and that, absent such an exemption, the political subdivision would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

	Signature	
	Title	
Date	Company	

CERTIFICATION ON VIOLATIONS

tha	t, to the best of his or her k	presentative ofnowledge and belief:	, hereby	y swears to and certifies
	Neither	, nor any substantiall und to be in violation of the	e Davis-Bacon Act pur S.C. 3145 or the Contr	ty of the Bidder (collectively suant to 40 U.S.C. 3144, the fact Work Hours and Safety parts.
	2 and 3 are not applicable	, continue to question 4.	•	True is selected questions
2.	Work Hours and Safety St	andards Act, or any of their iolation, the nature of the	New York State count	Copeland Act, the Contract terparts, state the name of the nsequence of the violation,
3.		on, state the name of the ag		leral government agency. If eged violation and the nature
	The Bidder's Dun & Brad I have authority to execute			by the Owner of this Project.
	Name		Title	_
Sw	orn to before me this	day of		, 20
No	etary Public			



10 Brown Road Ithaca, New York 14850 (607) 277-7100

Ithaca, New York Farmingdale, New York Albany, New York

ID FROM (Bidder's Name)	:	
,		
Bidder's Telephone	:	
Bidder's Facsimile (Fax)	:	
Bidder's E-mail Address	:	
(if applicable)		

BID FORM (submit in duplicate)

CONTRACT: MHS-1 (GC) GENERAL CONSTRUCTION

PROJECT TITLE: RECONSTRUCTION TO DOBBS FERRY MIDDLE HIGH SCHOOL

DATE: JULY 2, 2020

PROJECT NO.: 234903-20001

BID TO: Board of Education

Dobbs Ferry Union Free School District

505 Broadway

Dobbs Ferry, New York 10522

The Bidder hereby certifies that it has examined and fully understands the requirements and intent of the Bidding Documents, including the Bidding Requirements and proposed Contract Documents; and proposes to furnish all labor, materials, and equipment necessary to complete the Work on, or before, the dates specified in the Contract Documents for the **BASE BID** sum of:

(words)	
(\$	(figures)

Show all amounts in both words and figures; in the event of a discrepancy between amounts written in words and figures, the amount written in words shall govern.

Refer to Division 01 Section "Allowances" for description of allowances to be included in the Base Bid above.

ALTERNATES

Indicate in the spaces provided below the amount to be added to or the amount to be deducted from (as applicable) the Base Bid if the Owner accepts the following Alternates described in Division 01 Section "Alternates".

Include in the amount of each Alternate, all labor, materials, overhead and profit, modification of Work specified in the Contract Documents, and additional work that may be required by acceptance of the Alternate.

ALTERNATE No. MHS-02 – HVAC IMPROVEMNTS TO ADMINISTRATION OFFICES 103, 103A, 105, 105A, 105B,	O FACILITIES, , 105C, 106, 106F	ACCOUNTING AND 3, 108, 109.
ADD to the Base Bid the sum of:		
	(\$)
(words)		(figures)
OR		
DEDUCT from the Base Bid the sum of:		
	(\$)
(words)		(figures)

UNIT PRICES

Refer to Division 01 Section "Unit Prices" for description of unit prices.

Unit Price 1: Trench Rock Excavation			
Unit of Measure: Per Cubic Yard			
Cost per Unit:	(Φ		,
(words)	(\$	(figures))
Unit Price 2: Bulk Rock Excavation			
Unit of Measure: Per Cubic Yard			
Cost per Unit:			
	(\$)
(words)		(figures)	
Unit Price 3: Replacement of Unsuitable On-Site Materia	<u>ıl</u>		
Unit Price 3: Replacement of Unsuitable On-Site Materia Unit of Measure: Per Cubic Yard	<u>ıl</u>		
-	_		
Unit of Measure: Per Cubic Yard Cost per Unit:	<u>al</u> (<u>\$</u>	(figures))
Unit of Measure: Per Cubic Yard	_	(figures))
Unit of Measure: Per Cubic Yard Cost per Unit:	_	(figures))
Unit of Measure: Per Cubic Yard Cost per Unit: (words) Unit Price 4: Replacement of Retaining Wall	_	(figures))
Unit of Measure: Per Cubic Yard Cost per Unit: (words) Unit Price 4: Replacement of Retaining Wall Unit of Measure: Per Square Foot	_	(figures))
Unit of Measure: Per Cubic Yard Cost per Unit: (words) Unit Price 4: Replacement of Retaining Wall	(\$	(figures))
Unit of Measure: Per Cubic Yard Cost per Unit: (words) Unit Price 4: Replacement of Retaining Wall Unit of Measure: Per Square Foot	_	(figures))

Unit Price 5: Removal and Replacement of 8-FT Tall Black Vinyl	Clad Chai	n Link Fencing	
Unit of Measure: Per Lineal Foot			
Cost per Unit:			
(words)	(\$	(figures))
Unit Price 6: Access Doors and Frames at Gypsum Wallboard Wa	alls and Ce	<u>ilings</u>	
Unit of Measure: Per Complete Fire-Rated Access Door			
Cost per Unit:			
(words)	(\$	(figures))
Unit Price 7: Fire Rated Access Doors and Frames at Gypsum Wa	allboard W	alls and Ceilings	
Unit of Measure: Per Complete Access Door			
Cost per Unit:			
(words)	(\$	(figures))
Unit Price 8: Access Doors and Frames at Plaster Walls and Ceili	ngs		
Unit of Measure: Per Complete Fire-Rated Access Door			
Cost per Unit:			
(words)	(\$	(figures))

Unit Price 9: Fire Rated Access Doors and Frames at Plaster Wal	ls and Ceil	<u>ings</u>	
Unit of Measure: Per Complete Fire-Rated Access Door			
Cost per Unit:			
(words)	(\$	(figures))
(Words)		(ligares)	
Unit Price 10.a.1: Abatement Unit Prices (ACM / ACM Plaster)			
Unit of Measure: Per Square Foot			
Cost per Unit:			
(words)	(\$	(figures))
Unit Price 10.a.2: Abatement Unit Prices (Replacement of VAT)			
Unit of Measure: Per Square Foot			
Cost per Unit:			
(words)	(\$	(figures))
Unit Price 10.a.3: Abatement Unit Prices (Roof Tar)			
Unit of Measure: Per Square Foot			
Cost per Unit:			
	(\$	(°)
(words)		(figures)	
Unit Price 10.a.4: Abatement Unit Prices (Roof Flashing)			
Unit of Measure: Per Square Foot			
Cost per Unit:			
(words)	(\$	(figures))

LIST OF ADDENDA RECEIVED

No	Date	No	Date
No	Date	No	Date
No.	Date	No.	Date

BID ATTACHMENTS

Enclosed with this Bid are the following attachments:

Attachment #1 - Non-Collusive Bidding Certification.

Attachment #2 - Certified Corporate Resolution.

Attachment #3 – Iranian Energy Divestment Certification

Attachment #4 – Certification on Violations

BID SECURITY

Enclosed with this Bid is bid security in the amount of five percent of the Base Bid.

EXECUTION OF CONTRACT

If written notice of the acceptance of this Bid is transmitted to the undersigned within 45 days following the Bid opening, the undersigned will, within 10 days following the Notice of Award, execute and transmit a Contract in the form as required by the Architect.

This Bid may be withdrawn at any time prior to the Bid opening.

SIGNATURE

()	NAME OF BIDDER (Corporate Name)
(Corporate Seal)	SIGNATURE (Corporate Officer)
())	
()	DATE:

GENERAL CONDITIONS TO BID NON-COLLUSIVE BIDDING CERTIFICATION

No bid will be accepted that does not have this form completely executed.

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:

- (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 any competitor;
- (b) 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;
- (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;
- (d) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in its behalf;
- (e) That attached hereto (if corporate bidder) is a certified copy of resolution authorizing the execution of this certified by the signature of this bid or proposal in behalf of the corporate bidder.

		(Individual)
		(Corporation)
Dated:	By	
		(Signature of Officer)

This Non-Collusive Bidding Certificate must be submitted with the bid.

CERTIFIED CORPORATE RESOLUTION

RESOLVED THAT	be authorized to sign and submit the bid or ving project:
three-d (103-d) of the general municipa	e certificate as to non-collusion required by section one hundred l law as to the act and deed of such corporation, and for any tificate this corporate bidder shall be liable under the penalties of
The foregoing is a true and correct copy of	of the resolution and adopted by
	at a meeting of its board of directors held on the
day of	20
	(Secretary)

IRANIAN ENERGY DIVESTMENT CERTIFICATION

Pursuant to Section 103-g Of the New York State General Municipal Law

- A. By submission of this bid/proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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 New York State Finance Law.
- B. A Bid/Proposal shall not be considered for award, nor shall any award be made where the condition set forth in Paragraph A above has not been complied with; provided, however, that in any case the bidder/proposer cannot make the foregoing certification set forth in Paragraph A above, the bidder/proposer shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where Paragraph A above cannot be complied with, the Purchasing Unit to the political subdivision, public department, agency or official thereof to which the bid/proposal is made, or his designee, may award a bid/proposal, on a case by case business under the following circumstances:
 - 1. The investment activities in Iran were made before April 12, 2012, the investment activities in Iran have not been expanded or renewed after April 12, 2012, and the Bidder/Proposer has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or
 - 2. The political subdivision makes a determination that the goods or services are necessary for the political subdivision to perform its functions and that, absent such an exemption, the political subdivision would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

	Signature
	Title
Date	Company

CERTIFICATION ON VIOLATIONS

— tha	, a rep at, to the best of his or her kn	oresentative ofowledge and belief:	, hereby swears to and certifies
1.	the "Bidder"), has been fou Copeland Act pursuant to	nd to be in violation of the Da	wned-affiliated entity of the Bidder (collectively vis-Bacon Act pursuant to 40 U.S.C. 3144, the 3145 or the Contract Work Hours and Safety York State counterparts.
		ation for questions 2 and 3 mu	ust be provided. If True is selected questions
2.	If the Bidder has been foun Work Hours and Safety Sta	nd to be in violation of the Day ndards Act, or any of their Nev olation, the nature of the vio	vis-Bacon Act, the Copeland Act, the Contract w York State counterparts, state the name of the plation and any consequence of the violation,
3.			local, state or federal government agency. If
	of the alleged violation bel		y, the date of the alleged violation and the nature
		treet D-U-N-S number isthis certification, knowing it w	vill be relied upon by the Owner of this Project.
	Name	Tit	le
Sw	orn to before me this	day of	
No	otary Public	_	



10 Brown Road Ithaca, New York 14850 (607) 277-7100

Ithaca, New York Farmingdale, New York Albany, New York

ID FROM (Bidder's Name)	:	
· · · ·		
Bidder's Telephone	:	
Bidder's Facsimile (Fax)	:	
Bidder's E-mail Address (if applicable)	:	

BID FORM (submit in duplicate)

CONTRACT: MHS-2 (RC) ROOFING CONSTRUCTION

PROJECT TITLE: RECONSTRUCTION TO DOBBS FERRY MIDDLE HIGH SCHOOL

DATE: JULY 2, 2020

PROJECT NO.: 234903-20001

BID TO: Board of Education

Dobbs Ferry Union Free School District

505 Broadway

Dobbs Ferry, New York 10522

The Bidder hereby certifies that it has examined and fully understands the requirements and intent of the Bidding Documents, including the Bidding Requirements and proposed Contract Documents; and proposes to furnish all labor, materials, and equipment necessary to complete the Work on, or before, the dates specified in the Contract Documents for the **BASE BID** sum of:

(words)	
	(\$
	(figures)

Show all amounts in both words and figures; in the event of a discrepancy between amounts written in words and figures, the amount written in words shall govern.

Refer to Division 01 Section "Allowances" for description of allowances to be included in the Base Bid above.

ALTERNATES

Indicate in the spaces provided below the amount to be added to or the amount to be deducted from (as applicable) the Base Bid if the Owner accepts the following Alternates described in Division 01 Section "Alternates".

Include in the amount of each Alternate, all labor, materials, overhead and profit, modification of Work specified in the Contract Documents, and additional work that may be required by acceptance of the Alternate.

ALTERNATE NO. MHS-01 – 30-YEAR	WARRANTY AT	DOBBS FERRY	MIDDLE / HIGH
<u>SCHOOL</u>			
ADD to the Base Bid the sum of:			
		(\$)
(words)		`	(figures)
	OR		
DEDUCT from the Base Bid the sum of:			
		(\$)
(words)			(figures)

UNIT PRICES

Refer to Division 01 Section "Unit Prices" for description of unit prices.

Unit Price 1: Replacement of Metal Roof Deck			
Unit of Measure: Per Square Foot			
Cost per Unit:			
(words)	(\$	(figures))
Unit Price 2: Roof Tar Abatement			
Unit of Measure:			
Cost per Unit:			
(words)	(<u>\$</u>	(figures))
Unit Price 3: Roof Flashing Abatement			
Unit of Measure: Per Cubic Yard			
Cost per Unit:	(0		
(words)	(\$	(figures))

LIST OF ADDENDA RECEIVED

No	Date	No	Date
No	Date	No	Date
No.	Date	No.	Date

BID ATTACHMENTS

Enclosed with this Bid are the following attachments:

Attachment #1 - Non-Collusive Bidding Certification.

Attachment #2 - Certified Corporate Resolution.

Attachment #3 – Iranian Energy Divestment Certification

Attachment #4 – Certification on Violations

BID SECURITY

Enclosed with this Bid is bid security in the amount of five percent of the Base Bid.

EXECUTION OF CONTRACT

If written notice of the acceptance of this Bid is transmitted to the undersigned within 45 days following the Bid opening, the undersigned will, within 10 days following the Notice of Award, execute and transmit a Contract in the form as required by the Architect.

This Bid may be withdrawn at any time prior to the Bid opening.

SIGNATURE

() NAME OF BIDDER (Corporate Name))
(Corporate Seal () SIGNATURE (Corporate Officer)
()
() DATE:

GENERAL CONDITIONS TO BID NON-COLLUSIVE BIDDING CERTIFICATION

No bid will be accepted that does not have this form completely executed.

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:

- (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 any competitor;
- (b) 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;
- (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;
- (d) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in its behalf;
- (e) That attached hereto (if corporate bidder) is a certified copy of resolution authorizing the execution of this certified by the signature of this bid or proposal in behalf of the corporate bidder.

		(Individual)
		(Corporation)
Dated:	By	
	<i>Dy</i>	(Signature of Officer)

This Non-Collusive Bidding Certificate must be submitted with the bid.

CERTIFIED CORPORATE RESOLUTION

RESOLVED THAT	be authorized to sign and submit the bid or g project:
three-d (103-d) of the general municipal la	ertificate as to non-collusion required by section one hundred two as to the act and deed of such corporation, and for any cate this corporate bidder shall be liable under the penalties of
The foregoing is a true and correct copy of the	ne resolution and adopted by
	at a meeting of its board of directors held on the
day of	20
	(Secretary)

IRANIAN ENERGY DIVESTMENT CERTIFICATION

Pursuant to Section 103-g Of the New York State General Municipal Law

- A. By submission of this bid/proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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 New York State Finance Law.
- B. A Bid/Proposal shall not be considered for award, nor shall any award be made where the condition set forth in Paragraph A above has not been complied with; provided, however, that in any case the bidder/proposer cannot make the foregoing certification set forth in Paragraph A above, the bidder/proposer shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where Paragraph A above cannot be complied with, the Purchasing Unit to the political subdivision, public department, agency or official thereof to which the bid/proposal is made, or his designee, may award a bid/proposal, on a case by case business under the following circumstances:
 - 1. The investment activities in Iran were made before April 12, 2012, the investment activities in Iran have not been expanded or renewed after April 12, 2012, and the Bidder/Proposer has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or
 - 2. The political subdivision makes a determination that the goods or services are necessary for the political subdivision to perform its functions and that, absent such an exemption, the political subdivision would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

	Signature	
	Title	
Date	Company	

CERTIFICATION ON VIOLATIONS

tha	t, to the best of his or her k	presentative ofnowledge and belief:	, hereby	y swears to and certifies
	Neither	, nor any substantiall und to be in violation of the	e Davis-Bacon Act pur S.C. 3145 or the Contr	ty of the Bidder (collectively suant to 40 U.S.C. 3144, the fact Work Hours and Safety parts.
	2 and 3 are not applicable	, continue to question 4.	•	True is selected questions
2.	Work Hours and Safety St	andards Act, or any of their iolation, the nature of the	New York State count	Copeland Act, the Contract terparts, state the name of the nsequence of the violation,
3.		on, state the name of the ag		leral government agency. If eged violation and the nature
	The Bidder's Dun & Brad I have authority to execute			by the Owner of this Project.
	Name		Title	_
Sw	orn to before me this	day of		, 20
No	etary Public			



10 Brown Road Ithaca, New York 14850 (607) 277-7100

Ithaca, New York Farmingdale, New York Albany, New York

:
:
:
:
:

BID FORM (submit in duplicate)

CONTRACT: MHS-3 (MC) MECHANICAL CONSTRUCTION

PROJECT TITLE: RECONSTRUCTION TO DOBBS FERRY MIDDLE HIGH SCHOOL

DATE: JULY 2, 2020

PROJECT NO.: 234903-20001

BID TO: Board of Education

Dobbs Ferry Union Free School District

505 Broadway

Dobbs Ferry, New York 10522

The Bidder hereby certifies that it has examined and fully understands the requirements and intent of the Bidding Documents, including the Bidding Requirements and proposed Contract Documents; and proposes to furnish all labor, materials, and equipment necessary to complete the Work on, or before, the dates specified in the Contract Documents for the **BASE BID** sum of:

(words)	
(\$	
	(figures)

Show all amounts in both words and figures; in the event of a discrepancy between amounts written in words and figures, the amount written in words shall govern.

Refer to Division 01 Section "Allowances" for description of allowances to be included in the Base Bid above.

ALTERNATES

Indicate in the spaces provided below the amount to be added to or the amount to be deducted from (as applicable) the Base Bid if the Owner accepts the following Alternates described in Division 01 Section "Alternates".

Include in the amount of each Alternate, all labor, materials, overhead and profit, modification of Work specified in the Contract Documents, and additional work that may be required by acceptance of the Alternate.

ALTERNATE NO. MHS-02 – HVAC IMPROVEMNTS TO FACILITIES, ACCOUNTING AND ADMINISTRATION OFFICES 103, 103A, 105, 105A, 105B, 105C, 106, 106B, 108, 109.				
ADD to the Base Bid the sum of:				
	(\$)		
(words)	`	(figures)		
OR				
DEDUCT from the Base Bid the sum of:				
	(\$)		
(words)		(figures)		

UNIT PRICES

Refer to Division 01 Section "Unit Prices" for description of unit prices.

Unit Price 1: Fin-tube Radiation				
Unit of Measure: 3' lengths of each scheduled variety				
Cost per Unit:				
(words)	(\$	(figures))	
Unit Price 2: Ductwork				
Unit Price 2: Ductwork Unit of Measure:				

LIST OF ADDENDA RECEIVED

No	Date	No	Date
No	Date	No	Date
No.	Date	No.	Date _

BID ATTACHMENTS

Enclosed with this Bid are the following attachments:

Attachment #1 - Non-Collusive Bidding Certification.

Attachment #2 - Certified Corporate Resolution.

Attachment #3 – Iranian Energy Divestment Certification

Attachment #4 – Certification on Violations

BID SECURITY

Enclosed with this Bid is bid security in the amount of five percent of the Base Bid.

EXECUTION OF CONTRACT

If written notice of the acceptance of this Bid is transmitted to the undersigned within 45 days following the Bid opening, the undersigned will, within 10 days following the Notice of Award, execute and transmit a Contract in the form as required by the Architect.

This Bid may be withdrawn at any time prior to the Bid opening.

SIGNATURE

(NAME OF BIDDER (Corporate Name))
Corporate Seal) SIGNATURE (Corporate Officer)
(}
() DATE:

GENERAL CONDITIONS TO BID NON-COLLUSIVE BIDDING CERTIFICATION

No bid will be accepted that does not have this form completely executed.

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:

- (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 any competitor;
- (b) 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;
- (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;
- (d) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in its behalf;
- (e) That attached hereto (if corporate bidder) is a certified copy of resolution authorizing the execution of this certified by the signature of this bid or proposal in behalf of the corporate bidder.

		(Individual)
		(Corporation)
Dated:	By	
	<i>Dy</i>	(Signature of Officer)

This Non-Collusive Bidding Certificate must be submitted with the bid.

CERTIFIED CORPORATE RESOLUTION

RESOLVED THAT	be authorized to sign and submit the bid or g project:
three-d (103-d) of the general municipal la	ertificate as to non-collusion required by section one hundred two as to the act and deed of such corporation, and for any cate this corporate bidder shall be liable under the penalties of
The foregoing is a true and correct copy of the	ne resolution and adopted by
	at a meeting of its board of directors held on the
day of	20
	(Secretary)

IRANIAN ENERGY DIVESTMENT CERTIFICATION

Pursuant to Section 103-g Of the New York State General Municipal Law

- A. By submission of this bid/proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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 New York State Finance Law.
- B. A Bid/Proposal shall not be considered for award, nor shall any award be made where the condition set forth in Paragraph A above has not been complied with; provided, however, that in any case the bidder/proposer cannot make the foregoing certification set forth in Paragraph A above, the bidder/proposer shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where Paragraph A above cannot be complied with, the Purchasing Unit to the political subdivision, public department, agency or official thereof to which the bid/proposal is made, or his designee, may award a bid/proposal, on a case by case business under the following circumstances:
 - 1. The investment activities in Iran were made before April 12, 2012, the investment activities in Iran have not been expanded or renewed after April 12, 2012, and the Bidder/Proposer has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or
 - 2. The political subdivision makes a determination that the goods or services are necessary for the political subdivision to perform its functions and that, absent such an exemption, the political subdivision would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

	Signature	
	Title	
Date	Company	

CERTIFICATION ON VIOLATIONS

tha	t, to the best of his or her k	presentative ofnowledge and belief:	, hereby	y swears to and certifies
	Neither	, nor any substantiall und to be in violation of the	e Davis-Bacon Act pur S.C. 3145 or the Contr	ty of the Bidder (collectively suant to 40 U.S.C. 3144, the fact Work Hours and Safety parts.
	2 and 3 are not applicable	, continue to question 4.	•	True is selected questions
2.	Work Hours and Safety St	andards Act, or any of their iolation, the nature of the	New York State count	Copeland Act, the Contract terparts, state the name of the nsequence of the violation,
3.		on, state the name of the ag		leral government agency. If eged violation and the nature
	The Bidder's Dun & Brad I have authority to execute			by the Owner of this Project.
	Name		Title	_
Sw	orn to before me this	day of		, 20
No	etary Public			



10 Brown Road Ithaca, New York 14850 (607) 277-7100

Ithaca, New York Farmingdale, New York Albany, New York

ID FROM (Bidder's Name)	:	
Bidder's Telephone	:	
Bidder's Facsimile (Fax)	:	
Bidder's E-mail Address (if applicable)	:	

BID FORM (submit in duplicate)

CONTRACT: MHS-4 (EC) ELECTRICAL CONSTRUCTION

PROJECT TITLE: RECONSTRUCTION TO DOBBS FERRY MIDDLE HIGH SCHOOL

DATE: JULY 2, 2020

PROJECT NO.: 234903-20001

BID TO: Board of Education

Dobbs Ferry Union Free School District

505 Broadway

Dobbs Ferry, New York 10522

The Bidder hereby certifies that it has examined and fully understands the requirements and intent of the Bidding Documents, including the Bidding Requirements and proposed Contract Documents; and proposes to furnish all labor, materials, and equipment necessary to complete the Work on, or before, the dates specified in the Contract Documents for the **BASE BID** sum of:

(words)	
(\$	
	(figures)

Show all amounts in both words and figures; in the event of a discrepancy between amounts written in words and figures, the amount written in words shall govern.

Refer to Division 01 Section "Allowances" for description of allowances to be included in the Base Bid above.

ALTERNATES

Indicate in the spaces provided below the amount to be added to or the amount to be deducted from (as applicable) the Base Bid if the Owner accepts the following Alternates described in Division 01 Section "Alternates".

Include in the amount of each Alternate, all labor, materials, overhead and profit, modification of Work specified in the Contract Documents, and additional work that may be required by acceptance of the Alternate.

ALTERNATE NO. MHS-02 – HVAC IMPROVEMNTS TO ADMINISTRATION OFFICES 103, 103A, 105, 105A, 105B,	O FACILITIES, 105C, 106, 106F	, ACCOUNTING AND 3, 108, 109.
ADD to the Base Bid the sum of:		
	(\$)
(words)		(figures)
OR		
DEDUCT from the Base Bid the sum of:		
	(\$)
(words)		(figures)

UNIT PRICES

Refer to Division 01 Section "Unit Prices" for description of unit prices.

Unit Price 1: Duplex Receptacles			
Unit of Measure: Per Receptacle			
Cost per Unit:			
cost per cint.	(\$)
(words)	(Ψ	(figures)	/
Unit Price 2: Lighting Switch			
Unit of Measure: Per Switch			
Cost per Unit:			
	(\$)
(words)		(figures)	
Unit Price 3: Occupancy Sensor			
Unit of Measure: Per Sensor			
Cost per Unit:			
	(\$)
(words)		(figures)	
Unit Price 4: Lighting Fixtures			
Unit of Measure: Per Lighting Fixture			
Cost per Unit:			
	(\$		`
(words)	(\$	(figures)	<i>)</i>

LIST OF ADDENDA RECEIVED

No	Date	No	Date
No	Date	No	Date
No.	Date	No.	Date

BID ATTACHMENTS

Enclosed with this Bid are the following attachments:

Attachment #1 - Non-Collusive Bidding Certification.

Attachment #2 - Certified Corporate Resolution.

Attachment #3 – Iranian Energy Divestment Certification

Attachment #4 – Certification on Violations

BID SECURITY

Enclosed with this Bid is bid security in the amount of five percent of the Base Bid.

EXECUTION OF CONTRACT

If written notice of the acceptance of this Bid is transmitted to the undersigned within 45 days following the Bid opening, the undersigned will, within 10 days following the Notice of Award, execute and transmit a Contract in the form as required by the Architect.

This Bid may be withdrawn at any time prior to the Bid opening.

SIGNATURE

()	NAME OF BIDDER (Corporate Name)
(Corporate Seal)	SIGNATURE (Corporate Officer)
()	
()	DATE:

GENERAL CONDITIONS TO BID NON-COLLUSIVE BIDDING CERTIFICATION

No bid will be accepted that does not have this form completely executed.

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:

- (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 any competitor;
- (b) 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;
- (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;
- (d) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in its behalf;
- (e) That attached hereto (if corporate bidder) is a certified copy of resolution authorizing the execution of this certified by the signature of this bid or proposal in behalf of the corporate bidder.

		(Individual)
		(Corporation)
Dated:	By	
	<i>Dy</i>	(Signature of Officer)

This Non-Collusive Bidding Certificate must be submitted with the bid.

CERTIFIED CORPORATE RESOLUTION

RESOLVED THAT	be authorized to sign and submit the bid or ng project:
three-d (103-d) of the general municipal	certificate as to non-collusion required by section one hundred law as to the act and deed of such corporation, and for any ficate this corporate bidder shall be liable under the penalties of
The foregoing is a true and correct copy of	the resolution and adopted by
	at a meeting of its board of directors held on the
day of	20
	(Secretary)

IRANIAN ENERGY DIVESTMENT CERTIFICATION

Pursuant to Section 103-g Of the New York State General Municipal Law

- A. By submission of this bid/proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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 New York State Finance Law.
- B. A Bid/Proposal shall not be considered for award, nor shall any award be made where the condition set forth in Paragraph A above has not been complied with; provided, however, that in any case the bidder/proposer cannot make the foregoing certification set forth in Paragraph A above, the bidder/proposer shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where Paragraph A above cannot be complied with, the Purchasing Unit to the political subdivision, public department, agency or official thereof to which the bid/proposal is made, or his designee, may award a bid/proposal, on a case by case business under the following circumstances:
 - 1. The investment activities in Iran were made before April 12, 2012, the investment activities in Iran have not been expanded or renewed after April 12, 2012, and the Bidder/Proposer has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or
 - 2. The political subdivision makes a determination that the goods or services are necessary for the political subdivision to perform its functions and that, absent such an exemption, the political subdivision would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

	Signature	
	Title	
Date	Company	

CERTIFICATION ON VIOLATIONS

— tha	, a rep at, to the best of his or her kn	resentative ofowledge and belief:	hereby swears to and certifies
1.	the "Bidder"), has been four Copeland Act pursuant to	nd to be in violation of the Da	wned-affiliated entity of the Bidder (collectively avis-Bacon Act pursuant to 40 U.S.C. 3144, the . 3145 or the Contract Work Hours and Safety York State counterparts.
		ation for questions 2 and 3 m	nust be provided. If True is selected questions
2.	If the Bidder has been foun Work Hours and Safety Sta	nd to be in violation of the Da ndards Act, or any of their Ne olation, the nature of the vio	avis-Bacon Act, the Copeland Act, the Contract ew York State counterparts, state the name of the colation and any consequence of the violation,
3.			local, state or federal government agency. If
	of the alleged violation belo		y, the date of the alleged violation and the nature
		treet D-U-N-S number isthis certification, knowing it v	will be relied upon by the Owner of this Project.
	Name	Tit	tle
Sw	orn to before me this	day of	
No	otary Public	_	

NAME OF BIDDER

Specified Product

PROPOSED PRODUCTS FORM

SUBMITTED BY THREE LOW BIDDERS WITHIN THREE DAYS FOLLOWING BID OPENING

In accordance with Articles 4 and 6 of the Instructions to Bidders, list specified products and corresponding proposed equivalent products below. Include additional pages as necessary.

Attach additional sheet explaining any aspect of the Contract Documents that cannot be complied with by the manufacturer or supplier of the proposed equivalent product.

Equivalent Product

Designation:

Manufacturer:

Designation:

Technical Section: Manufacturer: Product Specified Product: Designation: Manufacturer: Technical Section: Product Designation: Specified Product: Technical Section: Manufacturer: **Product** Designation: Specified Product: Manufacturer: Technical Section: Product Specified Product: Designation: Manufacturer: ____ Technical Section: Product Specified Product: Designation: Technical Section: Manufacturer: Product

Specified Product:

Technical Section:

Specified Product:

Product

Subcontractor Name

PROPOSED SUBCONTRACTORS FORM

SUBMITTED BY THREE LOW BIDDERS WITHIN THREE DAYS FOLLOWING BID OPENING

Review of proposed subcontractors shall be in accordance with Article 5.2 of the General Conditions.

Instructions:

1. List below name of each subcontractor whose figures have been used in preparing the Bid, and to whom a subcontract is expected to be awarded, upon Architect's review, should the Contract be awarded to the Bidder.

Specification Section

2. For each subcontractor, identify the Specification section(s) included in that subcontract.

PROPOSED SCHEDULE OF VALUES FORM

SUBMITTED BY THREE LOW BIDDERS WITHIN THREE DAYS FOLLOWING BID OPENING

For the convenience of the Owner's preliminary analysis of the Bid, list the value of the Work included in the Base Bid sum for each building:

Springhurst Elementary School	\$
	•
Dobbs Ferry Middle High School	\$
Total Base Bid	\$

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

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.

BOND AMOUNT:

PROJECT:

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

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

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

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this

day of

(Witness)	(Contractor as Principal)	(Seal)
(miness)	(Title)	
ATP.	(Surety)	(Seal)
(Witness)	(Title)	

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

1



AIA Document A310™ – 2010 Instructions

Bid Bond

GENERAL INFORMATION

Purpose. AlA Document A310TM_2010 establishes the maximum penal amount that may be due the Owner if the Bidder fails to execute the contract and to provide the required performance and payment bonds, if any. It provides assurance that, if a bidder is offered a contract based on its tendered proposal but fails to enter into the contract, the Owner will be paid the difference in cost to award the contract to the next qualified bidder, so long as the difference does not exceed the maximum penal amount of the bond.

Related Documents. A310 is not incorporated by reference into other AIA documents. For further reference on bonding procedures, see AIA Document A701TM-1997, Instructions to Bidders; and AIA Document G612TM-2001, Owner's Instructions to Architect.

Use of Non-AIA Forms. AIA Document A310 may be used with any appropriate AIA or non-AIA document. CAUTION SHOULD BE EXERCISED BEFORE ITS USE TO VERIFY ITS COMPLIANCE WITH CURRENT LAWS AND REGULATIONS BY CONSULTING WITH AN ATTORNEY OR A BOND SPECIALIST.

USING A310-2010

Modifications. Particularly with respect to professional or contractor licensing laws, building codes, taxes, monetary and interest charges, arbitration, indemnification, format and font size, AIA Contract Documents may require modification to comply with state or local laws. Users are encouraged to consult an attorney before completing or modifying a document.

In a purchased paper AIA Contract Document, necessary modifications may be accomplished by writing or typing the appropriate terms in the blank spaces provided on the document, or by attaching Supplementary Conditions, special conditions or referenced amendments.

Modifications directly to purchased paper AIA Contract Documents may also be achieved by striking out language. However, care must be taken in making these kinds of deletions. Under NO circumstances should standard language be struck out to render it illegible. For example, users should not apply blocking tape, correction fluid or Xs that would completely obscure text. Such practices may raise suspicion of fraudulent concealment, or suggest that the completed and signed document has been tampered with. Both parties should initial handwritten changes.

Using AIA software, modifications to insert information and revise the standard AIA text may be made as the software permits.

By reviewing properly made modifications to a standard AIA Contract Document, parties familiar with that document can quickly understand the essence of the proposed relationship. Commercial exchanges are greatly simplified and expedited, good faith dealing is encouraged, and otherwise latent clauses are exposed for scrutiny.

AIA Contract Documents may not be retyped or electronically scanned. Retyping can introduce typographic errors and cloud legal interpretation given to a standard clause. Furthermore, retyping and electronic scanning are not permitted under the user's limited license for use of the document, constitute the creation of a derivative work and violate the AIA's copyright.

Identification of the Parties. The Contractor, the Surety, and the Owner should be identified using their respective full names and addresses or legal titles under which the bond is to be executed. The state in which the Surety is incorporated also should be identified in the space provided.

Bond Amount. The dollar amount of the bond should be provided in both written and numerical form.

Project Description. The proposed project should be described in sufficient detail to identify (1) the official name or title of the facility; (2) the location of the site; (3) the proposed building type, size, scope or usage; and (4) the project number required by the owner, if any. A project number may be required by certain public owners to adequately identify the project to which the bond pertains.

Execution of the Bond. The bond must be signed by both the Contractor and the Surety. The parties executing (signing) the bond should print their title and impress their corporate seal, if any. Where appropriate, attach a copy of the resolution or bylaw authorizing the individual to act on behalf of the firm or entity. As to the Surety, this usually takes the form of a power of attorney issued by the Surety company to the bond producer (agent) who signs on its behalf.

AIA Document A310™ - 2010. Copyright © 1963, 1970 and 2010 by The American institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties, Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. Purchasers are permitted to reproduce ten (10) copies of this document when completed. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO:
ADDRESS:
SUBMITTED BY:
NAME:
ADDRESS:
PRINCIPAL OFFICE:
[] Corporation[] Partnership[] Individual[] Joint Venture[] Other
NAME OF PROJECT: (if applicable) Calgi Construction
TYPE OF WORK: (file separate form for each Classification of Work)
[] General Construction
[] HVAC
[] Electrical
[] Plumbing
 Sther: (Specify) 1. ORGANIZATION 1.1 How many years has your organization been in business as a Contractor?
§ 1.2 How many years has your organization been in business under its present business name?
§ 1.2.1 Under what other or former names has your organization operated?

ADDITIONS AND DELETIONS:

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

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

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.

- § 1.3 If your organization is a corporation, answer the following:
 - § 1.3.1 Date of incorporation:
 - § 1.3.2 State of incorporation:
 - § 1.3.3 President's name:

- § 1.3.4 Vice-president's name(s)
- § 1.3.5 Secretary's name:
- § 1.3.6 Treasurer's name:
- § 1.4 If your organization is a partnership, answer the following:
 - § 1.4.1 Date of organization:
 - § 1.4.2 Type of partnership (if applicable):
 - § 1.4.3 Name(s) of general partner(s)
- § 1.5 If your organization is individually owned, answer the following:
 - § 1.5.1 Date of organization:
 - § 1.5.2 Name of owner:
- § 1.6 If the form of your organization is other than those listed above, describe it and name the principals:
- § 2. LICENSING
- § 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.
- § 2.2 List jurisdictions in which your organization's partnership or trade name is filed.
- § 3. EXPERIENCE
- § 3.1 List the categories of work that your organization normally performs with its own forces.
- § 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)
 - § 3.2.1 Has your organization ever failed to complete any work awarded to it?
 - § 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?
 - § 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?
- § 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

§ 3.4.1 State total worth of work in progress and under contract:

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

§ 3.5.1 State average annual amount of construction work performed during the past five years:

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

§ 4. REFERENCES

§ 4.1 Trade References:

§ 4.2 Bank References:

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

§ 4.3.2 Name and address of agent:

§ 5. FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

- § 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:
- § 5.1.3 Is the attached financial statement for the identical organization named on page one?
- § 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).
- § 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

§ 6. SIGNATURE

§ 6.1 Dated at this day of

Name of Organization:

By:

Title:

§ 6.2

M being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this day of

Notary Public:

My Commission Expires:



SURETY:

Performance Bond

CONTRACTOR:

(Name, legal status and address)	(Name, legal status and principal place of business)
OWNER: (Name, legal status and address)	
CONSTRUCTION CONTRACT Date:	
Amount:	
Description: (Name and location)	
BOND Date: (Not earlier than Construction Contract Date)	e)
Amount:	
Modifications to this Bond: ☐ None	☐ See Section 16
CONTRACTOR AS PRINCIPAL Company: (Corporate Seal)	SURETY Company: (Corporate Seal)
Signature:	Signature:
Name and Title: (Any additional signatures appear on the las	Name and Title: t page of this Performance Bond.)
(FOR INFORMATION ONLY — Name, adds AGENT or BROKER:	ress and telephone) OWNER'S REPRESENTATIVE: (Architect, Engineer or other party:)

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.

AlA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

- § 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 Default:
 - .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
- § 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
- § 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
- § 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
- § 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
- § 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
- § 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 - .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
- § 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

Init.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the

Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

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

§ 16 Modifications to this bond are as follows:

rate Seal) Company: (C	Corporate Seal)
Signature: Name and Title:	
	Signature;



Payment Bond

CONTRACTOR:

(Name, legal status and address)	(Name, legal status and principal place of business)
OWNER: (Name, legal status and address)	
CONSTRUCTION CONTRACT Date:	
Amount:	
Description: (Name and location)	
BOND Date: (Not earlier than Construction Contract Date)	e)
Amount:	
Modifications to this Bond: ☐ None	☐ See Section 18
CONTRACTOR AS PRINCIPAL Company: (Corporate Seal)	SURETY Company: (Corporate Seal)
Signature:	Signature:
Name	Name
and Title: (Any additional signatures appear on the las	and Title: t page of this Payment Bond.)
(FOR INFORMATION ONLY — Name, addr AGENT or BROKER:	

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.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

1

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

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

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

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

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

(Space is provided below for additional CONTRACTOR AS PRINCIPAL	ionai signatures of added	SURETY	earing on the cover page.)
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:		Signature:	
Name and Title: Address		Name and Title: Address	
CAUTION: You should sign an origi	nal AIA Contract Document	on which this text annears in F	RED. An original assures that

Init.

FORM OF MAINTENANCE BOND (TWO YEARS)

KNOW ALL MEN BY THESE PRESENTS:

That We,				
	1.0000	(hereinafter	called the Principal)	
as Principal and the and place of business for the State of New (hereinafter called the Surety) as Surety,	,a	Co	rporation with an office	
and place of business for the State of New	York at		,New York,	
(hereinafter called the Surety) as Surety,	are held and fire	nly bound un	to the	
(hereinafter called the Obligee) as Obligee	e in the sum of			
(hereinafter called the Obligee) as Obligee of the United States of America, for the p		(\$)DOLLARS, lawful	money
of the United States of America, for the p	ayment whereof	the Principa	l and Surety bind themse	lves,
their successors and assigns, jointly and	severally, firmly	by these pre	sents.	
Signed, sealed and dated this		day of	20	
Digitou, delited and dated this		14. July 101	320	
WHEREAS, the Principal hereto	fore entered into	o written ac	ntraat	
WITEREAS, the I fincipal hereto	nore entered mid) a written co	miraci	
with the Obligee for				
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			•	
WHEREAS, said Contract provide	es that the Princ	ipal shall gu	arantee	
NOW MURDERODE 41 1:4:	-CAL:L1:4:-	- i kh.	et if the chang Duin duel of	h-11
NOW, THEREFORE, the condition indemnify the Obligee against loss by reasons.				
or deficiencies in materials or workmansh				
period of <u>TWO</u> year(s) from the date of				
otherwise to remain in full force and effec		•	Ŭ	•
	Principal	1		
	pv.			
	D1:			
	BY:			

ATE of	COUNTY OF	
n this	day of	before me personally appeared the
		, and know to me to be
the individual described in	and who executed the within bond, and	
acknowledged to me that he		executed the same

NOTARY PUBLIC



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

AGREEMENT made as of the day of (In words, indicate day, month and year.)	in the year	ADDITIONS AND DELETIONS:
BETWEEN the Owner: (Name, legal status, address and other information) and the Contractor: (Name, legal status, address and other information)		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.
for the following Project:		This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
(Name, location and detailed description) The Construction Manager: (Name, legal status, address and other information)		This document is intended to be used in conjunction with AIA Documents A232™–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2009, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2009, Standard Form of Agreement Between Owner and Construction Manager as Adviser.
The Architect: (Name, legal status, address and other information)		AIA Document A232™–2009 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

The Owner and Contractor agree as follows.

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| TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS
- 10 INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner. (Insert the date of commencement, if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

Date of Commencement

If, prior to the commencement of the Work, the Owner requires time to file mortgages, mechanics' liens and other security interests, the Owner's time requirement shall be as follows:

- § 3.2 The Contract Time shall be measured from the date of commencement.
- § 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than () days from the date of commencement, or as follows:

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents. (Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following: (Check the appropriate box.)

l]	Stipulated Sum, in accordance with Section 4.2 below
]	1	Cost of the Work plus the Contractor's Fee without a Guaranteed Maximum Price, in accordance with Section 4.3 below
]]	Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below. Based on the selection above, also complete either Section 5.1.4, 5.1.5 or 5.1.6 below.)

§ 4.2 Stipulated Sum

- § 4.2.1 The Stipulated Sum shall be (\$), subject to additions and deletions as provided in the Contract Documents.
- § 4.2.2 The Stipulated Sum is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 4.2.3 Unit prices, if any:

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

Item

Units and Limitations

Price per Unit (\$0.00)

§ 4.2.4 Allowances included in the Stipulated Sum, if any:

(Identify allowance and state exclusions, if any, from the allowance price.)

Item

Allowance

§ 4.3 Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price

§ 4.3.1 The Contract Sum is the Cost of the Work as defined in Exhibit A, Determination of the Cost of the Work, plus the Contractor's Fee.

§ 4.3.2 The Contractor's Fee:

(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

User Notes:

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- § 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:
- § 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:
- § 4.3.5 Rental rates for Contractor-owned equipment shall not exceed percent (%) of the standard rate paid at the place of the Project.
- § 4.3.6 Unit prices, if any:

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

Item

Units and Limitations

Price per Unit (\$0.00)

- § 4.3.7 The Contractor shall prepare and submit to the Construction Manager for the Owner, in writing, a Control Estimate within 14 days of executing this Agreement. The Control Estimate shall include the items in Section A.1 of Exhibit A, Determination of the Cost of the Work.
- § 4.4 Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price
- § 4.4.1 The Contract Sum is the Cost of the Work as defined in Exhibit A, Determination of the Cost of the Work, plus the Contractor's Fee.
- § 4.4.2 The Contractor's Fee:

(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

- § 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:
- § 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:
- § 4.4.5 Rental rates for Contractor-owned equipment shall not exceed percent (%) of the standard rate paid at the place of the Project.
- § 4.4.6 Unit Prices, if any:

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

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Units and Limitations

Price per Unit (\$0.00)

- § 4.4.7 Guaranteed Maximum Price
- § 4.4.7.1 The sum of the Cost of the Work and the Contractor's Fee is guaranteed by the Contractor not to exceed (\$), subject to additions and deductions by changes in the Work as provided in the Contract Documents. Such maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner. (Insert specific provisions if the Contractor is to participate in any savings.)

- § 4.4.7.2 The Guaranteed Maximum Price is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
- § 4.4.7.3 Allowances included in the Guaranteed Maximum Price, if any: (Identify and state the amounts of any allowances, and state whether they include labor, materials, or both.)

Item

Allowance

§ 4.4.7.4 Assumptions, if any, on which the Guaranteed Maximum Price is based:

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

- § 5.1.1 Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and upon certification of the Project Application and Project Certificate for Payment or Application for Payment and Certificate for Payment by the Construction Manager and Architect and issuance by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.
- § 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:
- § 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the day of a month, the Owner shall make payment of the certified amount in the Application for Payment to the Contractor not later than the day of the month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment shall be made by the Owner not later than () days after the Construction Manager receives the Application for Payment.

 (Federal, state or local laws may require payment within a certain period of time.)

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

- § 5.1.4.1 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form and supported by such data to substantiate its accuracy as the Construction Manager and Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.
- § 5.1.4.2 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.
- § 5.1.4.3 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
 - .1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of percent (%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute may be included as provided in Section 7.3.9 of the General Conditions;
 - .2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of percent (%);
 - .3 Subtract the aggregate of previous payments made by the Owner; and

- **.4** Subtract amounts, if any, for which the Construction Manager or Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of the General Conditions.
- **§ 5.1.4.4** The progress payment amount determined in accordance with Section 5.1.4.3 shall be further modified under the following circumstances:
 - .1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to percent (%) of the Contract Sum, less such amounts as the Construction Manager recommends and the Architect determines for incomplete Work and unsettled claims; and
 - .2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of the General Conditions.
- § 5.1.4.5 Reduction or limitation of retainage, if any, shall be as follows:

(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.4.3.1 and 5.1.4.3.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

- § 5.1.5 Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price
- § 5.1.5.1 With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit A, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor; less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.
- § 5.1.5.2 Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.
- § 5.1.5.3 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
 - .1 Take the Cost of the Work as described in Exhibit A, Determination of the Cost of the Work;
 - Add the Contractor's Fee, less retainage of percent (%). The Contractor's Fee shall be computed upon the Cost of the Work described in that Section at the rate stated in that Section; or if the Contractor's Fee is stated as a fixed sum, an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;
 - .3 Subtract retainage of percent (%) from that portion of the Work that the Contractor self-performs;
 - .4 Subtract the aggregate of previous payments made by the Owner;
 - .5 Subtract the shortfall, if any, indicated by the Contractor in the documentation required by Article 5 or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
 - .6 Subtract amounts, if any, for which the Construction Manager or Architect has withheld or withdrawn a Certificate for Payment as provided in Section 9.5 of AIA Document A232TM—2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition.
- § 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon (1) a mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.
- § 5.1.5.5 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has used

amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.5.6 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.6 Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price

- § 5.1.6.1 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor; less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.
- § 5.1.6.2 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form and supported by such data to substantiate its accuracy as the Construction Manager and Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.
- § 5.1.6.3 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work for which the Contractor has made or intends to make actual payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.
- § 5.1.6.4 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
 - .1 Take that portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values. Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.10 of AIA Document A232–2009;
 - .2 Add that portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work, or if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing;
 - .3 Add the Contractor's Fee, less retainage of percent (%). The Contractor's Fee shall be computed upon the Cost of the Work at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, shall be an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;
 - .4 Subtract retainage of percent (%) from that portion of the Work that the Contractor self-performs;
 - .5 Subtract the aggregate of previous payments made by the Owner;
 - .6 Subtract the shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
 - .7 Subtract amounts, if any, for which the Construction Manager or Architect have withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A232–2009.
- § 5.1.6.5 The Owner and the Contractor shall agree upon a (1) mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.
- § 5.1.6.6 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Construction Manager or Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; that the

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Construction Manager or Architect have made exhaustive or continuous on-site inspections; or that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.6.7 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

- § 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when
 - .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2 of AIA Document A232–2009, and to satisfy other requirements, if any, which extend beyond final payment;
 - .2 the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit A,
 Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or
 without a Guaranteed Maximum payment; and
 - a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect; such final payment shall be made by the Owner not more than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A232–2009, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker. (If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A232–2009, the method of binding dispute resolution shall be as follows:

(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

[]	Arbitration pursuant to Section 15.4 of AIA Document A232–2009.
[]	Litigation in a court of competent jurisdiction.
[1	Other: (Specify)

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2009.

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2009.

- § 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price § 7.2.1 Subject to the provisions of Section 7.2.2 below, the Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2009.
- § 7.2.2 The Contract may be terminated by the Owner for cause as provided in Article 14 of AIA Document A232–2009; however, the Owner shall then only pay the Contractor an amount calculated as follows:
 - .1 Take the Cost of the Work incurred by the Contractor to the date of termination;
 - .2 Add the Contractor's Fee computed upon the Cost of the Work to the date of termination at the rate stated in Sections 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion; and
 - .3 Subtract the aggregate of previous payments made by the Owner.
- § 7.2.3 If the Owner terminates the Contract for cause when the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, and as provided in Article 14 of AIA Document A232–2009, the amount, if any, to be paid to the Contractor under Section 14.2.4 of AIA Document A232–2009 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.2.
- § 7.2.4 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders.
- § 7.2.5 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2009; in such case, the Contract Sum and Contract Time shall be increased as provided in Section 14.3.2 of AIA Document A232–2009, except that the term 'profit' shall be understood to mean the Contractor's Fee as described in Sections 4.3.2 and 4.4.2 of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

- § 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2009 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.
- § 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located. (Insert rate of interest agreed upon, if any.)

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§ 8.3 The Owner's representative: (Name, address and other information)

§ 8.4 The Contractor's representative: (Name, address and other information)

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- § 8.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.
- § 8.6 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

- § 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.
- § 9.1.1 The Agreement is this executed AIA Document A132–2009, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition.
- § 9.1.2 The General Conditions are, AIA Document A232–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition.
- § 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
§ 9.1.4 The Specifications: (Either list the Specifications	s here or refer to an ex	hibit attached to this Ag	reement.)
Section	Title	Date	Pages
§ 9.1.5 The Drawings: (Either list the Drawings her	re or refer to an exhibi	t attached to this Agreen	nent.)
Number		Title	Date
§ 9.1.6 The Addenda, if any:			
Number		Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents are:

Init.

- .1 AIA Document A132TM–2009, Exhibit A, Determination of the Cost of the Work, if applicable.
- .2 AIA Document E201TM–2007, Digital Data Protocol Exhibit, if completed, or the following:
- .3 AIA Document E202[™]–2008, Building Information Modeling Protocol Exhibit, if completed, or the following:
- .4 Other documents, if any, listed below:
 (List here any additional documents which are intended to form part of the Contract Documents. AIA
 Document A232–2009 provides that bidding requirements such as advertisement or invitation to bid,
 Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents
 unless enumerated in this Agreement. They should be listed here only if intended to be part of the
 Contract Documents.)

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2009.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A232–2009.)

Type of Insurance or Bond

Limit of Liability or Bond Amount (\$0.00)

This Agreement is entered into as of the day	and year first written above.	
OWNER (Signature)	CONTRACTOR (Signature)	
(Printed name and title)	(Printed name and title)	

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

for the following PROJECT:

(Name, and location or address)

THE CONSTRUCTION MANAGER:

(Name, legal status and address)

THE OWNER:

(Name, legal status and address)

THE ARCHITECT:

(Name, legal status and address)

ADDITIONS AND DELETIONS:

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

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

This document is intended to be used in conjunction with AIA Documents A132™–2009, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2009, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2009, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

- § 1.1.1 The Contract Documents. The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement), and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of addenda relating to bidding requirements).
- § 1.1.2 The Contract. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.
- § 1.1.3 The Work. The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.
- § 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Multiple Prime Contractors and by the Owner's own forces, including persons or entities under separate contracts not administered by the Construction Manager.
- § 1.1.5 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.
- § 1.1.6 The Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.
- § 1.1.7 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.
- § 1.1.8 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

- § 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.
- § 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

- § 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect, or Architect's consultants' reserved rights.
- § 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 Transmission of Data in Digital Form

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

ARTICLE 2 OWNER

§ 2.1 General

- § 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Article 4, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.
- § 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Information and Services Required of the Owner

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

- § 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, through the Construction Manager, shall secure and pay for the building permit.
- § 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.
- § 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.
- § 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.
- § 2.2.6 The Owner shall endeavor to forward all communications to the Contractor through the Construction Manager and shall contemporaneously provide the same communications to the Architect about matters arising out of or relating to the Contract Documents.

§ 2.3 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect, after consultation with the Construction Manager. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 General

- § 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.
- § 3.1.2 The plural term "Multiple Prime Contractors" refers to persons or entities who perform construction under contracts with the Owner that are administered by the Construction Manager. The term does not include the Owner's own forces, including persons or entities under separate contracts not administered by the Construction Manager.

- § 3.1.3 The Contractor shall perform the Work in accordance with the Contract Documents.
- § 3.1.4 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

- § 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.
- § 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.
- § 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.
- § 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instruction concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner, the Construction Manager, and the Architect and shall not proceed with that portion of the Work without further written instructions from the Architect, through the Construction Manager. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

- § 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.
- § 3.3.3 The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

- § 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.
- § 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.
- § 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

The Contractor warrants to the Owner, Construction Manager, and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform with the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 Taxes

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

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

- § 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, through the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.
- § 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.
- § 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.
- § 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect and

Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor in writing, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

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

- § 3.8.2 Unless otherwise provided in the Contract Documents:
 - .1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
 - .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances: and
 - .3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.
- § 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

- § 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.
- § 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner and Architect through the Construction Manager, the name and qualifications of a proposed superintendent. The Construction Manager may reply within 14 days to the Contractor in writing stating (1) whether the Owner, the Construction Manager, or the Architect has reasonable objection to the proposed superintendent or (2) that any of them require additional time to review. Failure of the Construction Manager to reply within the 14 day period shall constitute notice of no reasonable objection.
- § 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information and the Construction Manager's approval a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at

appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project schedule to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Multiple Prime Contractors or the construction or operations of the Owner's own forces.

- § 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter update it as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.
- § 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager and Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.
- § 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager and Architect and incorporated into the approved Project schedule.

§ 3.11 Documents and Samples at the Site

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

§ 3.12 Shop Drawings, Product Data and Samples

- § 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
- § 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
- § 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- § 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.9 through 4.2.11. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.
- § 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Construction Manager Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the Project submittal schedule approved by the Construction Manager and Architect, or in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Multiple Prime Contractors or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples and similar submittals with related documents submitted by other Multiple Prime Contractors.

- § 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
- § 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed and approved by the Architect.
- § 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Construction Manager and Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.
- § 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.
- § 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 Use of Site

- § 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.
- § 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner's own forces or of other Multiple Prime Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner's own forces or by other Multiple Prime Contractors except with written consent of the Construction Manager, Owner and such other Multiple Prime Contractors; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the other Multiple Prime Contractors or the Owner the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

- § 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.
- § 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Construction Manager and Architect access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

- § 4.1.2 The Owner shall retain a construction manager lawfully licensed to practice construction management or an entity lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.
- § 4.1.3 Duties, responsibilities and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Construction Manager, Architect and Contractor. Consent shall not be unreasonably withheld.
- § 4.1.4 If the employment of the Construction Manager or Architect is terminated, the Owner shall employ a successor construction manager or architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 4.2 Administration of the Contract

- § 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment. The Construction Manager and Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.
- § 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner and Construction Manager (1) known deviations from the Contract Documents and from the most recent Project schedule prepared by the Construction Manager, and (2) defects and deficiencies observed in the Work.
- § 4.2.3 The Construction Manager shall provide a staffing plan to include one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner reasonably informed of the progress of the Work, and will report to the Owner and Architect (1) known deviations from the Contract Documents and the most recent Project schedule, and (2) defects and deficiencies observed in the Work.
- § 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Multiple Prime Contractors in accordance with the latest approved Project schedule.
- § 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, or charge of, construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of or be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.
- § 4.2.6 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Construction Manager, and shall contemporaneously provide the same communications to the Architect about matters arising out of or relating to the Contract Documents. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with other Multiple Prime Contractors shall be through the Construction Manager and shall be contemporaneously provided to the Architect if those communications are about matters arising out of or related to the Contract Documents. Communications by and with the Owner's own forces shall be through the Owner.

- § 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.
- § 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents and will notify each other about the rejection. The Construction Manager shall determine in general whether the Work of the Contractor is being performed in accordance with the requirements of the Contract Documents and notify the Owner, Contractor and Architect of defects and deficiencies in the Work. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require additional inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, upon written authorization of the Owner, whether or not such Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing any of the Work.
- § 4.2.9 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data and Samples. Where there are Multiple Prime Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from Contractor and other Multiple Prime Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.
- § 4.2.10 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.
- § 4.2.11 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Construction Manager and Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Construction Manager and Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.
- § 4.2.12 The Construction Manager will prepare Change Orders and Construction Change Directives.
- § 4.2.13 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7. and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4
- § 4.2.14 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples and similar

required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

- § 4.2.15 The Construction Manager will assist the Architect in conducting inspections to determine the dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.
- § 4.2.16 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.
- § 4.2.17 The Architect will interpret and decide matters concerning performance under, and requirements of the Contract Documents on written request of the Construction Manager, Owner or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.
- § 4.2.18 Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith.
- § 4.2.19 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.
- § 4.2.20 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing to the Construction Manager to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Construction Manager for review by the Owner, Construction Manager and Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Construction Manager may reply within 14 days to the Contractor in writing stating (1) whether the Owner, the Construction Manager or the Architect has reasonable objection to any such proposed person or entity or, (2) that the

User Notes:

Construction Manager, Architect or Owner requires additional time for review. Failure of the Construction Manager, Owner, or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

- § 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.
- § 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.
- § 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Subsubcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

- § 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that
 - assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
 - .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

- § 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.
- § 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY OTHER CONTRACTORS

§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

- § 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, which include persons or entities under separate contracts not administered by the Construction Manager, and to award other contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.
- § 6.1.2 When the Owner performs construction or operations with the Owner's own forces including persons or entities under separate contracts not administered by the Construction Manager, the Owner shall provide for coordination of such forces with the Work of the Contractor, who shall cooperate with them.
- § 6.1.3 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11 and 12.

§ 6.2 Mutual Responsibility

- § 6.2.1 The Contractor shall afford the Owner's own forces, Construction Manager and other Multiple Prime Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.
- § 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces or other Multiple Prime Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Construction Manager and Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's own forces or other Multiple Prime Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.
- § 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a separate contractor or to other Multiple Prime Contractors because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces or other Multiple Prime Contractors.
- § 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner, separate contractors, or other Multiple Prime Contractors as provided in Section 10.2.5.
- § 6.2.5 The Owner and other Multiple Prime Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

- § 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor; a Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.
- § 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 Change Orders

A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect and Contractor, stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

- § 7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.
- § 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.
- § 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
 - .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
 - .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
 - .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
 - .4 As provided in Section 7.3.7.
- § 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.
- § 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager and Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.
- § 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.
- § 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed:
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .5 Additional costs of supervision and field office personnel directly attributable to the change.
- § 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.
- § 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.
- § 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order issued through the Construction Manager and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 Definitions

- § 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.
- § 8.1.2 The date of commencement of the Work is the date established in the Agreement.
- § 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.
- § 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

- § 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.
- § 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.
- § 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner, Owner's own forces, Construction Manager, Architect, any of the other Multiple Prime Contractors or an employee of any of them, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration, or by other causes that the Architect, based on the recommendation of the Construction Manager, determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

- § 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.
- § 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 Schedule of Values

Where the Contract is based on a Stipulated Sum or Guaranteed Maximum Price, the Contractor shall submit to the Construction Manager, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Construction Manager and Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. In the event there is one Contractor, the Construction Manager shall forward to the Architect the Contractor's schedule of values. If there are Multiple Prime Contractors responsible for performing different portions of the Project, the Construction Manager shall forward the Multiple Prime Contractors' schedules of values only if requested by the Architect.

§ 9.3 Applications for Payment

- § 9.3.1 At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner, Construction Manager or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.
- § 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.
- § 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier unless such Work has been performed by others whom the Contractor intends to pay.
- § 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.
- § 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for

Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 Certificates for Payment

- § 9.4.1 Where there is only one Contractor, the Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either issue to the Owner a Certificate for Payment, with a copy to the Construction Manager, for such amount as the Architect determines is properly due, or notify the Construction Manager and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.
- § 9.4.2 Where there are Multiple Prime Contractors performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives the Multiple Prime Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Multiple Prime Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Multiple Prime Contractors' application with information from similar applications for progress payments from other Multiple Prime Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Multiple Prime Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.
- § 9.4.3 Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager, for such amount as the Architect determines is properly due, or notify the Construction Manager and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.
- § 9.4.4 The Construction Manager's certification of an Application for Payment or, in the case of Multiple Prime Contractors, a Project Application and Certificate for Payment shall be based upon the Construction Manager's evaluation of the Work and the information provided as part of the Application for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information and belief, the Work has progressed to the point indicated and the quality of the Work is in accordance with the Contract Documents. The certification will also constitute a recommendation to the Architect and Owner that the Contractor be paid the amount certified.
- § 9.4.5 The Architect's issuance of a Certificate for Payment or in the case of Multiple Prime Contractors, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and information provided as part of the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated, that the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified.
- § 9.4.6 The representations made pursuant to Sections 9.4.4 and 9.4.5 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Construction Manager or Architect.
- § 9.4.7 The issuance of a separate Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed the Contractor's construction means, methods, techniques,

sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment or Project Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.4 and 9.4.5 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.3. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment or Project Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- 4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor:
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.
- § 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.
- § 9.5.3 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager and both will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

- § 9.6.1 After the Architect has issued a Certificate for Payment or Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.
- § 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.
- § 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.
- § 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner, Construction Manager nor

Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

- § 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.
- § 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.
- § 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 Failure of Payment

If the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Construction Manager and Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

- \S 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.
- § 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.
- § 9.8.3 Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the requirements of the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion.
- § 9.8.4 When the Architect, assisted by the Construction Manager, determines that the Work or designated portion thereof is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a written notice that the Work is ready for final inspection and acceptance and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager will evaluate the completion of Work of the Contractor and then forward the notice and Application, with the Construction Manager's recommendations, to the Architect who will promptly make such inspection. When the Architect, finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

- § 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from
 - .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
 - .2 failure of the Work to comply with the requirements of the Contract Documents; or
 - .3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Subsubcontractors:
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and
- .4 construction or operations by the Owner or other Contractors.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

- § 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.
- § 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.
- § 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly

employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to, asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner, Construction Manager and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify a presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resumed upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is not due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS *ALSO SEE SUPPLEMANTARY GENERAL CONDITIONS § 11.1 Contractor's Liability Insurance

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle; and
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be submitted to the Construction Manager for transmittal to the Owner with a copy to the Architect prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Construction Manager, the Construction Manager's consultants, the Owner, the Architect, and the Architect's

consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 Owner's Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 Property Insurance

- § 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Subsubcontractors in the Project.
- § 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for the Architect's, Contractor's, and Construction Manager's services and expenses required as a result of such insured loss.
- § 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.
- § 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.
- § 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.
- § 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.
- § 11.3.2 Boiler and Machinery Insurance. The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Construction Manager, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.
- § 11.3.3 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

- § 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.
- § 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, adjoining or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.
- § 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.
- § 11.3.7 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees each of the other, and (2) the Construction Manager, Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as the Owner and Contractor may have to the proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, Owner's separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.
- § 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.
- § 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.
- § 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or distribution of insurance proceeds in accordance with the direction of the arbitrators.

§ 11.4 Performance Bond and Payment Bond

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

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

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

§ 12.2 Correction of Work

§ 12.2.1 Before or After Substantial Completion

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

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

- § 12.2.2. The one-year period shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.
- § 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.
- § 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.
- § 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors or other Multiple Prime Contractors caused by the

Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

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

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

- § 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.
- § 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 Written Notice

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity or to an officer of the corporation for which it was intended; or if delivered at or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 Rights and Remedies

- § 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.
- § 13.4.2 No action or failure to act by the Owner, Construction Manager, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

§ 13.5 Tests and Inspections

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and

- (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.
- § 13.5.2 If the Construction Manager, Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs except as provided in Section 13.5.3, shall be at the Owner's expense.
- § 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses shall be at the Contractor's expense.
- § 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.
- § 13.5.5 If the Construction Manager or Architect is to observe tests, inspections or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.
- § 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 Time Limits on Claims

The Owner and the Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and the Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

- § 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:
 - .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
 - .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
 - .3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
 - .4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

- § 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.
- § 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, costs incurred by reason of such termination, and damages.
- § 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

- § 14.2.1 The Owner may terminate the Contract if the Contractor
 - .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
 - .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
 - .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
 - .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.
- § 14.2.2 When any of the above reasons exist, the Owner, after consultation with the Construction Manager, and upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
 - .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
 - .2 Accept assignment of subcontracts pursuant to Section 5.4; and
 - .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.
- § 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.
- § 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Initial Decision Maker after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

- § 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.
- § 14.3.2 The Contract Sum and the Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.4 Termination by the Owner for Convenience

- § 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.
- § 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall
 - .1 cease operations as directed by the Owner in the notice;
 - .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work;
 - .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
- § 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

- § 15.1.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract The responsibility to substantiate Claims shall rest with the party making the Claim.
- § 15.1.2 Notice of Claims. Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Construction Manager and or Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.
- § 15.1.3 Continuing Contract Performance. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Construction Manager will prepare Change Orders and the Architect will issue a Certificate for Payment or Project Certificate for Payment in accordance with the decisions of the Initial Decision Maker.
- § 15.1.4 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.3.

§ 15.1.5 Claims for Additional Time

- § 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.
- § 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.
- § 15.1.6 Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes
 - .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

- § 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.
- § 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.
- § 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.
- § 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.
- § 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect and Construction Manager, if the Architect or Construction Manager is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.
- § 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.
- § 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.
- § 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.
- § 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

- § 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.
- § 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.
- § 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

- § 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.
- § 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.
- § 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.
- § 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

- § 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).
- § 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.
- § 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

DOCUMENT 00 60 20 - SUPPLEMENTARY GENERAL CONDITIONS

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The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction" A.I.A. Document A232-2009 edition. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph, or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 1 - GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

Delete Subparagraph 1.1.1 and replace with the following:

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Instructions to Bidders, the Agreement between Owner and Contractor (hereinafter 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.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following sentence to Subparagraph 1.2.2:

The items listed under the SUMMARY ARTICLE in each section of the specifications are in intended as a guide without limiting the scope of the work.

Add the following new Subparagraphs 1.2.4 and 1.2.5:

- 1.2.4 Sections of Division 1 General Requirements govern the execution of the work of all sections of the specifications.
- 1.2.5 If in the interpretation of Contract documents it appears that the Drawings and/or Specifications are not in agreement in whole or in part, the one requiring the **GREATER QUANTITY OR SUPERIOR QUALITY SHALL PREVAIL**, as decided by the Architect.

ARTICLE 3 – CONTRACTOR

3.5 WARRANTY

Add the following new Subparagraphs3.5.1 & 3.5.2:

- 3.5.1 The warranty provided in paragraph 3.5 shall be in addition to and not in limitation of any other warranty or remedy required by law or by the Contract Documents.
- 3.5.2 The contractor shall deliver to the owner upon completion of all work under this contract, its written guarantee made out to the owner in a form satisfactory to the Owner, guaranteeing (and it does hereby so guarantee), all of the work under the Contract to be free from faulty labor or faulty materials. This guarantee shall be made to cover (and does cover) a period of one year from the date of completion of all work under the Contract or for a longer period where so stipulated in the Contract Documents. The warranty set forth herein shall survive expiration and /or termination of this contract.

3.6 TAXES

Delete paragraph 3.6.1 and insert the following:

3.6.1 The Owner is exempt from payment of Federal, State and local sales and use taxes, on all materials and supplies incorporated into the project pursuant to the provisions of this Contract. This exemption does not, however, apply to tools, machinery, equipment, or other property leased by or to a contractor or a subcontractor and the contractor and his subcontractors shall be responsible for any and all applicable taxes, including sales and compensating use taxes, on such leased tools, machinery, equipment or other property.

3.10 CONTRACTOR'S PROGRESS SCHEDULE

Add the following new Subparagraphs 3.10.5 3.10.6, 3.10.7, 3.10.8 and 3.10.9:

- 3.10.5 The Contractor shall establish schedules for (a) the progress of the work as a whole and for the various parts, and (b) a materials delivery schedule.
- 3.10.6 The Contractor shall notify the Owner, Architect and Construction Manager immediately in writing of any occurrences that could forcibly cause a deviation from schedules.
- 3.10.7 No adjustment or extension of the schedule or time in which the Contract is to be performed will be made or granted except as provided in Paragraph 8.3 It shall be the responsibility of the Contractor to distribute copies of the Progress Schedule to all interested parties, and to prepare and distribute any revisions of said schedules at his cost and expense.
- 3.10.8 The Contractor and each subcontractor shall so prosecute their work that they not only maintains their progress in accordance with the schedule, but also shall cause no delays to other contractors and subcontractors engaged on the project.
- 3.10.9 Should the Contractor, either in person or through a subcontractor, fail to maintain progress according to the Progress Schedule, or cause delay to another contractor or subcontractor, they shall furnish such additional labor and/or services or work such overtime as may be necessary to bring their operations up to schedule, at their own expense. Failure to maintain schedule or to take the above steps to regain the schedule shall constitute default.

ARTICLE 7 - CHANGES IN THE WORK

7.3 CONSTRUCTION CHANGE DIRECTIVES

Add the following new Subparagraph 7.3.11:

7.3.11 In Subparagraph 7.3.7, the allowance 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, 15 percent of the cost.
- .2 For the Contractor, for Work performed by the Contractor's Subcontractor, 10 percent of the amount due the Subcontractor.
- .3 Cost to which overhead and profit are to be applied shall be determined in accordance with Subparagraph 7.3.7.
- .4 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 Sub-contracts with the latter submitted in typewritten form on the Sub-Contractor's company letterhead.

Add the following new Subparagraph 7.3.12:

7.3.12 Delays and approvals for extension of time to the Contract completion date shall not be considered as Changes in the Work and as such shall not entitle the Contractor to claims for additional compensation.

ARTICLE 8 – TIME

Add the following new Subparagraph 8.2.4:

8.2.4 The date of commencement is the date from which the Contract Time of Paragraph 8.1.2 is measured, and shall be the date of the Agreement, as first written, unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

The date of commencement shall be determined in the notice to proceed. Unless the date of commencement is established by a notice to proceed issued by the Owner, the Contractor shall notify the Owner, through the Construction Manager, in writing not less than five days before commencing the Work to permit the timely filing of mortgages, mechanic's liens, and other security interests.

8.3 DELAYS AND EXTENSIONS OF TIME

Delete Subparagraph 8.3.1 and insert the following:

8.3.1 If the Contractor is delayed at any time in the progress of the work by any cause beyond his control and which, in the opinion of the Architect, based on the recommendation of the Construction Manager, should entitle the Contractor to an extension of time, such as unavoidable casualties, substantial changes ordered in the work, or other similar occurrences, the time to perform or the date of completion shall be extended for such period as the Architect shall determine. Adverse weather conditions, however, shall not constitute a ground for an extension of time unless in the opinion of the Architect they are catastrophic in nature.

Add the following new Subparagraph 8.3.4 and 8.3.5:

- 8.3.4 Granting of an extension of time shall not be considered a change in the Work nor will it be considered grounds for additional compensation from the Owner.
- 8.3.5 Notwithstanding anything to the contrary in the Contract Documents, an extension of the Contract Time, to the extent permitted under Paragraph 8.3.1 shall be the sole remedy of the Contractor for 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 (4) any delay-related claim (collectively referred in this subparagraph 8.3.3 as "Delay") whether or not such Delay is foreseeable. In no event shall the Contractor be entitled to any compensation or recovery of any damages, in connection with any Delay, including, without limitation, consequential damages, lost opportunity cost, impact damages, labor inefficiency damages, or overhead costs.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.3 APPLICATIONS FOR PAYMENT

Delete Subparagraph 9.3.1 and insert the following:

9.3.1 The Owner will make partial payments to the Contractor monthly on the basis of a duly certified estimate of the work performed during the preceding calendar month as prepared by the Contractor and determined by the Construction Manager and Architect to be properly due. At least ten days before the date established for each progress payment, the Contractor shall submit to the Construction Manager and Architect an itemized Application for Payment, notarized, subscribed and acknowledged in conformity with the laws of the State of New York, supported by such data substantiating the Contractor's right to payment as the Owner, Construction Manager or the Architect may require, such as copies of requisitions from subcontractors and material suppliers. In making such partial payment monthly, there shall be retained Five (5) percent of the payment amount due. The form of Application for Payment shall be a notarized AIA Doc G-702/Cma, Application and Certification for Payment, supported by AIA G-703, Continuation Sheet.

ARTICLE 11 - INSURANCE AND BONDS (SEE EXHIBIT "A" AT THE END OF SECTION FOR FUTHER INORMATION) <u>Must Provide Letter from Insurance Carrier certifying that Contractor meets Insurance Requirements as per bid specifications</u>

Add the following Clause 11.1.1.9 to 11.1.1:

- 11.1.1.9 Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:
- .1 Premises Operation (including X, C and U coverages as applicable).
- .2 Independent Contractor's Protective.
- .3 Products and Completed Operations.
- .4 Personal Injury Liability with Employment Exclusion deleted.
- .5 Contractual, including specified provision for Contractor's obligations under Paragraph 3.18.
- .6 Owned, non-owned, and hired motor vehicles.
- .7 Broad Form Property Damage, including Completed Operations.

Add the following Clause 11.1.2.1 to 11.1.2:

The insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

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.

Owners Contractors Protective (OCP) Insurance

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 District as the Named Insured.

For projects greater than \$1,000,000 and work over 1 story (10 feet); \$2 million per occurrence, \$4 million aggregate with the District as the Named Insured.

For all projects where General Liability, Auto and Umbrella/Excess Coverage is with non-licensed and non-admitted carriers in New York State; \$2 million per occurrence, \$4 million aggregate with the District as the named Insured.

The District will be the Named Insured on OCP Policies. There will be no Additional Insureds on any OCP Policies.

Automobile Liability

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

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.

Builder's Risk

Must be purchased by the contractor to include interest of the Owner and Contractor jointly in a form satisfactory to the owner. 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.

Umbrella/Excess Insurance

\$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.

\$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.

Contractor acknowledges that failure to obtain such insurance on behalf of the District constitutes a material breach of contract and subjects it to liability for damages, indemnification and all other legal remedies available to the District. The contractor is to provide the District with a certificate of insurance, evidencing the above requirements have been met, prior to the commencement of work.

Sub-contractors are subject to the same terms and conditions as stated above and submit same to the District for approval prior to start of any work.

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 District, its 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.

ADDITIONAL REQUIREMENTS ASBESTOS, LEAD ABATEMENT AND/OR HAZARDOUS MATERIALS

Asbestos/Lead Abatement 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.

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 District 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 the District.

11.4 PERFORMANCE BOND AND PAYMENT BOND

Delete Subparagraph 11.4.1 as written and insert the following:

11.4.1 The Contractor shall, at his cost and expense, furnish bonds in the amount of 100 percent of the Contract Sum covering the faithful performance of the contract and the payment of all obligations arising thereunder, in such form as the Owner may prescribe and with such sureties may be approved by the Owner. Said bonds shall remain in full force and effect during the term of any warranty or guarantee to be furnished hereunder, and in no event for a period of less than one year following the issuance of a final certificate. The Contractor shall keep the bonding company informed of any and all changes in the amount of his contract with the Owner.

ARTICLE 13 – MISCELLANEOUS PROVISIONS

13.5 TESTS AND INSPECTIONS

Add the phrase "or public utility company" after the words "public authority(ies)" in the third and eighth lines of Subparagraph 13.5.1.

Add the phrase "or public utility company" after the words "public authorities" in the second line of Subparagraph 13.5.2.

13.6 INTEREST

Delete Paragraph 13.6

- 13.7 Delete Section 13.7 in its entirety and replace it with the following:
 - 13.7 Time Limits on Claims. Claims by Contractor must be made within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is earlier. Claims by Owner must be made within a reasonable time after Owner recognizes the conditions giving rise to the Claim. Claims must be made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.

13.10 LABOR REQUIREMENTS

- 13.10.1 The Contractor and each Subcontractor performing the Work under this Contract shall comply with all applicable labor laws.
- 13.10.2 State of New York, Department of Labor, Bureau of Public Work, Contract Requirements and Schedules of Prevailing Hourly Wage Rates and Supplements are contract requirements.
- 13.10.3 Contractor shall submit to the Owner monthly transcripts of Certified payroll records in a form accepted by the New York State Department of Labor.
- 13.10.4 Updated wage rates are available on-line from the New York State Department of Labor's web site.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

Section 14.2.2 – delete the words "after consultation with the Construction Manager, and upon certification by the Architect".

EXHIBIT A- Insurance Requirements Section

INSURANCE REQUIREMENTS – CONTRACTORS

- 1. Notwithstanding any terms, conditions or provisions, in any other writing between the parties, the contractor hereby agrees to effectuate the naming of the District as an Additional Insured on the contractor's insurance policies, except for workers' compensation and N.Y. State Disability insurance. Also name as additionally insured: the Architect and their Consultants, Construction Manager, and Asbestos Abatement Monitoring Services and Special Inspection Agency are to be named later, and their respective members, officers, employees and agents
- 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 to conduct business in New York State. A New York licensed and admitted insurer is strongly preferred. The decision to accept non-licensed and non-admitted carriers lies exclusively with the District and may create significant vulnerability and costs for the District
 - b. State that the organization's coverage shall be primary and non-contributory coverage for the District, its Board, employees and volunteers.
 - c. Additional insured status shall be provided by standard or other endorsements that extend coverage to the District for on-going operations (CG 20 38) and products and completed operations (CG 20 37). The decision to accept an endorsement rest solely with the District. A completed copy of the endorsements must be attached to the Certificate of Insurance.
- 3. The certificate of insurance must describe the services provided by the contractor (e.g., roofing, carpentry or plumbing) that are covered by the liability policies.
 - a. At the District's 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.
 - b. 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.
- 4. The contractor agrees to indemnify the District 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 work on 1 story (10 feet) only; \$1 million per occurrence, \$2 million aggregate with the District as the Named Insured.

For projects greater than \$1,000,000 and work over 1 story (10 feet); \$2 million per occurrence, \$4 million aggregate with the District as the Named Insured.

For all projects where General Liability, Auto and Umbrella/Excess Coverage is with non-licensed and non-admitted carriers in New York State; \$2 million per occurrence, \$4 million aggregate with the District as the named Insured.

The District 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 by the contractor to include interest of the Owner and Contractor jointly in a form satisfactory to the owner. 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.

f. Umbrella/Excess Insurance

\$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.

\$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.

- 6. Contractor acknowledges that failure to obtain such insurance on behalf of the District constitutes a material breach of contract and subjects it to liability for damages, indemnification and all other legal remedies available to the District. The contractor is to provide the District with a certificate of insurance, evidencing the above requirements have been met, prior to the commencement of work.
- 7. Sub-contractors are subject to the same terms and conditions as stated above and submit same to the District for approval prior to start of any work.

8. 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 District, its 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.

ADDITIONAL REQUIREMENTS ASBESTOS, LEAD ABATEMENT AND/OR HAZARDOUS MATERIALS

Asbestos/Lead Abatement 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.

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 District 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 the District

CONSTRUCTION MILESTONE SCHEDULE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes Milestone dates to be met and indicated in the Contractor's Construction Schedule.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for submitting schedules and reports and for submittal schedule.
 - 2. Division 1 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule

1.3 MILESTONE

A. The following preliminary construction schedule indicates milestones that are critical points in time, which must be incorporated in the Contractor's Construction Schedule.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTIONS (Not Used)

END OF SECTION

Act F	Responsibility	Description	Orig Dur	Rem Early Dur Start	ily Early irt Finish	irly iish _{MAR}	2021 APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL
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1130 Phase 1 -	- Summer 2	Temporary Services + Protection 2021	20 Zd	2d 24JUN21	21 25JUN21	V21	Temporary Services + Protection
Springhur	Springhurst Elementary School	School	500	1000		20	
1140	PRIME	SES-1 GC Contract - Secured Vestibule	38d	38d 24JUN21	21 17AUG21	G21 321	SES-1 GC Contract - Secured Vestibule
1150	PRIME	SES-1 GC Contract - Library Enhancements	27d	27d 24JUN21		321	SES-1 GC Contract - Library Enhancements
1160	PRIME PRIME	SES-2 SC Contract - Visitor Driveway Sidewalk SES-2 SC Contract - Varsity Softball Field	32d 32d	32d 24JUN21 32d 24JUN21		G21 321	SES-2 SC Contract - Visitor Driveway Sidewalk SES-2 SC Contract - Varsity Softball Field
1180	PRIME	Substantial Completion + Punch List	2d 5d	5d 03AUG21 5d 10AUG21		321 321	Testing Substantial Completion + Punch List Project Close
Middle/High	igh School	rioject Ciosecou	D - 6	Id I Augs		175	moscon molecularity
1210	PRIME	MHS-1 GC Contract - GC Work Related to	33d 33d	38d 24JUN21	21 17AUG21 21 10AUG21	G21 121	MHS-1 GC Contract - GC Work Related to HVAC Work(Critical Path - Dunnage Structrual for HVAC Equipment; Non Critical Path - Site Work)
1220	PRIME	MHS-2 RC Contract - Roofing Work Area 2 & 4	33d	33d 24JUN21		321	MHS-2 RC Contract - Roofing Work Area 2 & 4 (Coordinate with HVAC Contract for Equipment Removal)
1230	PRIME	MHS-3 MC Contract - HVAC Chiller, Ice Tank & MHS-4 EC Contract - EC Work Related to	33d	33d 24JUN21	21 10AUG21	321	WIND-3 MC Contract - TryAC Chiller, ice Tank & And
1250	PRIME	Substantial Completion + Punch List	2d 2d	5d 11AUG21		125 125	Substantial Completion + Punch List
1270	_	Completion of Phase 1	0	0		G21	Completion of Phase 1
H	PRIME		200d	200d 10SEP21	21 24JUN22	122	
Middle/High							
1280	PRIME	MHS-1 GC Contract - GC Complete Site Work	200d 195d	200d 10SEP21 195d 10SEP21	21 24JUN22 21 17JUN22	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	MHS-1 GC Contract - GC Complete Site Work (Complete Phase 1 Site Work if NOT Finish
1290	PRIME	MHS-3 MC Contract - Steam Control & HVAC	190d 5d	190d 10SEP21		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	HYAC Piping Rough In for Phase 3 HVAC Work) Testing
1320	PRIME	Substantial Completion + Punch List Completion of Phase 2	2d 0	5d 20JUN22 0	22 24JUN22 24JUN22	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Substantial Completion + Punch List Completion of Phase 2
hase 3 -	<u></u>	2022					
Middle/High	PRIME		985 280	38d 27JUN22	22 18AUG22	77.5	
ilu/ainolik			38d	38d 27JUN22	22 18AUG22	322	
1330	PRIME	MHS-1 GC Contract - GC Work Related to MHS-2 RC Contract - Roding Work Area 1 & 3	33d	33d 27JUN22		322	MHS-1 GC Contract - GC Work Area 1 & 3
1350	PRIME	MHS-3 MC Contract - HVAC AHU & Complete MHS-4 FC Contract - FC Work Related to	28d	28d 27JUN22		322	MHS-3 MC Contract - HVAC AHU & Complete All
1370	PRIME	Testing	2d	5d 05AUG22		322	Testing Completion - Durch list
1390	PRIME	Substantial Completion + Purion List Completion of Phase 3	p 0	0		322 322	Completion of Phase 3
ompletion	tion		700	7000		000	
1400	PRIME	Project Closeout for Middle/High School	20d	20d 19AUG22	322 16SEP22	225	Project Closeout for Middle/High School
				_	LLUGE	- 000	

Andrew M. Cuomo, Governor

Dobbs Ferry Union Free SD

Thomas Farlow, Project Manager Tetra Tech Archs & Engs 10 Brown Road Ithaca NY 14850 Schedule Year Date Requested PRC#

2020 through 2021 09/16/2020 2020009575

Roberta Reardon, Commissioner

Location 505 Broadway Project ID# 234903-20001

Project Type Reconstruction at Dobbs Ferry Middle High School and Springhurst Elementary School

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 2020 through June 2021. 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 / C	ANCELLATION OF PROJECT
Date Completed:	Date Cancelled:
Name & Title of Representative:	

Phone: (518) 457-5589 Fax: (518) 485-1870 W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission: a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion online.

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

There are very few exceptions to this rule. Complete information regarding these exceptions is available on the "Request for a dispensation to work overtime" form (PW30) and "4 Day / 10 Hour Work Schedule" form (PW 30.1).

Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12240; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.nv.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemperaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid

or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment. Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, but are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed \$100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds \$25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8. Section 220-a).

Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYSDOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "Public Work Project" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers. compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers. Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeyworkers in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above or is performing work outside the classification of work for which the apprentice is indentured, must be paid the prevailing journeyworker's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12240 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b)).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of \$50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c)).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d)).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.

Andrew M. Cuomo, Governor

Dobbs Ferry Union Free SD

Thomas Farlow, Project Manager Tetra Tech Archs & Engs 10 Brown Road Ithaca NY 14850

Schedule Year Date Requested PRC#

2020 through 2021 09/16/2020 2020009575

Roberta Reardon, Commissioner

Location 505 Broadway Project ID# 234903-20001

Project Type Reconstruction at Dobbs Ferry Middle High School and Springhurst Elementary School

Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), MUST be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, enter the required information and mail OR fax this form to the office shown at the bottom of this notice. OR fill out the electronic version via the NYSDOL website.

Contractor Information All information must be supplied

Federal Employer Identification N	umber:	
Name:		
City: Amount of Contract: Approximate Starting Date: Approximate Completion Date:	\$/ State:	Zip: Contract Type: [] (01) General Construction [] (02) Heating/Ventilation [] (03) Electrical [] (04) Plumbing [] (05) Other :

Phone: (518) 457-5589 Fax: (518) 485-1870 W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

Social Security Numbers on Certified Payrolls:

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concern regarding inclusion of this information on payrolls if another identifier will suffice.

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to \$1,500 for a first offense and up to \$5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, www.labor.ny.gov. https://labor.ny.gov/formsdocs/ui/IA999.pdf

If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov.

Worker Notification: (Labor Law §220, paragraph a of subdivision 3-a)

This provision is an addition to the existing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage rate* for their particular job classification on each pay stub*. It also requires contractors and subcontractors to post a notice at the beginning of the performance of every public work contract on each job site that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her job classification. The required notification will be provided with each wage schedule, may be downloaded from our website www.labor.ny.gov or be made available upon request by contacting the Bureau of Public Work at 518-457-5589. *In the event the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

(05.19)

To all State Departments, Agency Heads and Public Benefit Corporations IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

To all State Departments, Agency Heads and Public Benefit Corporations IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor Administrative Finance Bureau-PWEF Unit Building 12, Room 464 State Office Campus Albany, NY 12240

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.



Required Notice under Article 25-B of the Labor Law

Attention All Employees, Contractors and Subcontractors: You are Covered by the Construction Industry Fair Play Act

The law says that you are an employee unless:

- You are free from direction and control in performing your job, and
- You perform work that is not part of the usual work done by the business that hired you, and
- You have an independently established business.

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.

Employee Rights: If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor, you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.

Penalties for paying workers off the books or improperly treating employees as independent contractors:

• **Civil Penalty** First offense: Up to \$2,500 per employee

Subsequent offense(s): Up to \$5,000 per employee

• Criminal Penalty First offense: Misdemeanor - up to 30 days in jail, up to a \$25,000 fine

and debarment from performing public work for up to one year.

Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a \$50,000 fine and debarment from performing public work for up to 5

years.

If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.

Employer Name:

New York State Department of Labor Bureau of Public Work

Attention Employees

THIS IS A: PUBLIC WORK PROJECT

If you are employed on this project as a worker, laborer, or mechanic you are entitled to receive the prevailing wage and supplements rate for the classification at which you are working.

Chapter 629 of the Labor Laws of 2007: These wages are set by law and must be posted at the work site. They can also be found at: www.labor.ny.gov

If you feel that you have not received proper wages or benefits, please call our nearest office.*

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 932-2419	White Plains	(914) 997-9507
Newburgh	(845) 568-5156		

* For New York City government agency construction projects, please contact the Office of the NYC Comptroller at (212) 669-4443, or www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name:			
Project Location:			

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is \$250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (Note: Completion cards do not have an expiration date.)
- Training roster, attendance record of other documentation from the certified trainer pending the issuance of the card.
- · Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is \$3 million in Bronx, Kings, New York, Queens and, Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirement s on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less that six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3
Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor Bureau of Public Work State Office Campus, Bldg. 12 Albany, NY 12240

District Office Locations:	Telephone #	FAX#
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Garden City	516-228-3915	516-794-3518
Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

Westchester County General Construction

Boilermaker 09/01/2020

JOB DESCRIPTION Boilermaker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

 Per Hour:
 07/01/2020
 01/01/2021

 Boilermaker
 \$ 61.24
 \$63.38

 Repairs & Renovations
 61.24
 63.38

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2020 01/01/2021

Boilermaker 32% of hourly 32% of hourly Repair \$ Renovations Wage Paid Wage Paid + \$ 25.35 + TBA

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay.

Repairs & Renovation Includes replacement of parts and repairs & renovation of existing unit.

OVERTIME PAY

See (D, O) on OVERTIME PAGE Repairs & Renovation see (B,E,Q)

HOLIDAY

Paid: See (8, 16, 23, 24) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 12, 15, 16, 22, 23, 24, 25) on HOLIDAY PAGE

07/01/2020

NOTE: *Employee must work in pay week to receive Holiday Pay.

**Employee gets 4 times the hourly wage rate for working Labor Day.

REGISTERED APPRENTICES

Wage per hour:

(1/2) Year Terms at the following pecentage of Boilermaker's Wage

1st 2nd 3rd 4th 5th 6th 7th 65% 70% 75% 80% 85% 90% 95%

Supplemental Benefits Per Hour:

Apprentice(s)	32% of Hourly Wage Paid Plus Amount Below	32% of Hourly Wage Paid Plus Amount Below
1st Term	\$ 19.38	\$ TBA
2nd Term	20.24	TBA
3rd Term	21.08	TBA
4th Term	21.94	TBA
5th Term	22.79	TBA
6th Term	23.65	TBA
7th Term	24.48	TBA

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

 Carpenter
 09/01/2020

01/01/2021

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2020

Piledriver \$ 55.93 Dockbuilder \$ 55.93 SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 52.44

OVERTIME PAY

See (B, E2, O) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour (1)year terms:

1st 2nd 3rd 4th \$22.37 \$27.97 \$36.35 \$44.74

Supplemental benefits per hour:

All Terms: \$ 34.34

8-1556 Db

Carpenter 09/01/2020

JOB DESCRIPTION Carpenter DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2020

Carpet/Resilient

Floor Coverer \$ 54.00

INCLUDES HANDLING & INSTALLATION OF ARTIFICIAL TURF AND SIMILAR TURF INDOORS/OUTDOORS.

SUPPLEMENTAL BENEFITS

Per hour:

\$46.99

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE.

Paid for 1st & 2nd yr.

Apprentices See (5,6,11,13,16,18,19,25)

Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICESWage per hour - (1) year terms:

1st 2nd 3rd 4th \$24.20 \$27.20 \$31.45 \$39.33

Supplemental benefits per hour:

1st 2nd 3rd 4th

\$16.06 \$17.56 \$21.16 \$23.16

8-2287

Carpenter 09/01/2020

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per Hour: 07/01/2020

Marine Construction:

Marine Diver \$ 70.80 Marine Tender 50.34

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 52.34

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 11, 13, 16, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour: One (1) year terms.

 1st year
 \$ 22.37

 2nd year
 27.97

 3rd year
 36.35

 4th year
 44.74

Supplemental Benefits

Per Hour:

All terms \$ 34.34

8-1456MC

Carpenter 09/01/2020

JOB DESCRIPTION Carpenter

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2020

Building

Millwright \$55.70

SUPPLEMENTAL BENEFITS

Per hour:

Millwright \$ 54.16

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18,19) on HOLIDAY PAGE.

Overtime See (5,6,8,11,13,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour: One (1) year terms:

1st. 2nd. 3rd. 4th. \$29.99 \$35.44 \$40.89 \$51.79

Supplemental benefits per hour:

One (1) year terms:

1st. 2nd. 3rd. 4th.

\$34.79 \$38.49 \$42.84 \$49.60

8-740.1

 Carpenter
 09/01/2020

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:

07/01/2020

Timberman \$51.05

SUPPLEMENTAL BENEFITS

Per Hour:

07/01/2020

\$51.79

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour: One (1) year terms:

> 1st 2nd 3rd 4th \$20.42 \$25.53 \$33.18 \$40.84

Supplemental benefits per hour:

All terms \$ 34.07

8-1556 Tm

Carpenter 09/01/2020

JOB DESCRIPTION Carpenter DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Westchester

PARTIAL COUNTIES

Orange: South of but including the following, Waterloo Mills, Slate Hill, New Hampton, Goshen, Blooming Grove, Mountainville, east to the Hudson River.

Putnam: South of but including the following, Cold Spring, TompkinsCorner, Mahopac, Croton Falls, east to Connecticut border.

Suffolk: West of Port Jefferson and Patchogue Road to Route 112 to the Atlantic Ocean.

WAGES

Per hour: 07/01/2020 10/18/2020

Core Drilling: Additional Driller \$41.19 \$2.00

Driller Helper 32.62

Note: Hazardous Waste Pay Differential:

For Level C, an additional 10% above wage rate per hour For Level B, an additional 10% above wage rate per hour For Level A, an additional 10% above wage rate per hour

Note: When required to work on water: an additional \$ 0.50 per hour.

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2020

Driller and Helper \$ 27.95

OVERTIME PAY

OVERTIME: See (B,E,K*,P,R**) on OVERTIME PAGE.

HOLIDAY

Paid: See (5,6) on HOLIDAY PAGE.

Overtime: * See (5,6) on HOLIDAY PAGE.

** See (8,10,11,13) on HOLIDAY PAGE.

8-1536-CoreDriller

Carpenter - Building / Heavy&Highway

09/01/2020

JOB DESCRIPTION Carpenter - Building / Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Putnam, Rockland, Westchester

WAGES

WAGES:(per hour)

07/01/2020 07/01/2021

BUILDING/HEAVY & HIGHWAY/TUNNEL:

Additional

Carpenter \$ 45.30 \$ 0.40

SHIFT DIFFERENTIAL: When it is mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen percent (15%) of wage plus applicable benefits.

NOTE: Carpenters employed in the removal or abatement of asbestos or any toxic or hazardous material or required to work near asbestos or any toxic or hazardous material and required to wear protective equipment shall receive two (2) hours extra pay per day, plus applicable supplemental benefits.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$31.53

OVERTIME PAY

BUILDING:

See (B, E, Q) on OVERTIME PAGE.

HEAVY&HIGHWAY/TUNNEL:

See (B, E, P, *R, **T, X) on OVERTIME PAGE.

*R applies to Heavy&Highway/Tunnel Overtime Holiday Code 25 with benefits at straight time rate.

**T applies to Heavy&Highway/Tunnel Overtime Holiday Codes 5 & 6 with benefits at straight time rate.

HOLIDAY

BUILDING:

Paid: See (1) on HOLIDAY PAGE.

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE.

Holidays that fall on Sunday will be observed Monday.

HEAVY&HIGHWAY/TUNNEL:

Paid: See (5, 6, 25) on HOLIDAY PAGE including benefits.

Overtime: See (5, 6, 25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

1 year terms at the following wage rates:

Indentured after July 1 2016

1st 2nd 3rd 4th 5th \$ 22.40 \$ 26.16 \$ 28.05 \$ 29.93 \$ 33.70

Indentured before July 1 2016

1st 2nd 3rd 4th \$ 22.40 \$ 26.16 \$ 29.93 \$ 33.70

SUPPLEMENTAL BENEFITS per hour:

All terms \$ 16.28

11-279.1B/HH

Electrician 09/01/2020

JOB DESCRIPTION Electrician

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond, Westchester

WAGES

Per hour: 07/01/2020 03/10/2021

Service Technician \$33.90 \$34.40

Service and Maintenance on Alarm and Security Systems.

Maintenance, repair and /or replacement of defective (or damaged) equipment on, but not limited to, Burglar - Fire - Security - CCTV - Card Access - Life Safety Systems and associated devices. (Whether by service contract of T&M by customer request.)

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: \$ 18.43 \$ 19.32

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE Overtime: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

9-3H

Electrician 09/01/2020

JOB DESCRIPTION Electrician DISTRICT 8

ENTIRE COUNTIES

Westchester

WAGES

Per hour: 07/01/2020

Electrician/A-Technician \$ 52.75 Teledata \$ 52.75

Note: On a job where employees are required to work on bridges over navigable waters, transmission towers, light poles, bosun chairs, swinging scaffolds, etc. 40 feet or more above the water or ground or under compressed air, or tunnel projects under construction or where assisted breathing apparatus is required, they will be paid at the rate of time and one-half for such work except on normal pole line or building construction work.

SUPPLEMENTAL BENEFITS

 Per hour:
 07/01/2020

 Journeyworker
 \$ 51.80

OVERTIME PAY

See (A, G, *J, P) on OVERTIME PAGE

*NOTE: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

	07/01/2020
1st term	\$ 13.00
2nd term	15.00
3rd term	17.00
4th term	19.00
MIJ 1-12 months	23.00
MIJ 13-18 months	26.50

Supplemental Benefits per hour:

	07/01/2020
1st term	\$ 9.49
2nd term	12.39
3rd term	13.72
4th term	15.05

MIJ 1-12 months 12.08 MIJ 13-18 months 13.38

8-3/W

Electrician 09/01/2020

JOB DESCRIPTION Electrician

DISTRICT 8

ENTIRE COUNTIES Westchester

WAGES

07/01/2020

Electrician \$ 26.50 H - Telephone \$ 26.50

Electrical and Teledata work of limited scope, consisting of repairs and /or replacement of defective electrical and teledata equipment.

- Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

See Electrician/A Technician classification for all new installations of wiring, conduit, junction boxes and light fixtures.

SUPPLEMENTAL BENEFITS

07/01/2020

Electrician &

H - Telephone \$ 13.38

OVERTIME PAY

See (B, G, *J, P) on OVERTIME PAGE

*Note: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

8-3m

Elevator Constructor 09/01/2020

JOB DESCRIPTION Elevator Constructor

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

PARTIAL COUNTIES

Rockland: Entire County except for the Township of Stony Point

Westchester: Entire County except for the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per hour:

	07/01/2019	03/17/2021
Elevator Constructor	\$ 69.56	\$ 72.29
Modernization & Service/Repair	\$ 54.56	\$ 56.77

SUPPLEMENTAL BENEFITS

Per Hour:

Elevator Constructor \$ 41.92 \$ 42.92

Modernization & \$ 40.86 \$ 41.82

Service/Repairs

OVERTIME PAY

Constructor See (D, M, T) on OVERTIME PAGE.

Modern/Service See (B, F, S) on OVERTIME PAGE.

HOLIDAY

Paid: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

DISTRICT 1

*Note:1st Term is based on Average wage of Constructor & Modernization. Terms 2 thru 4 Based on Journeymans wage of classification Working in.

1 YEAR TERMS:

1st Term*	2nd Term		3rd Term		4th Term
50%	55%		65%		75%
SUPPLEMENTAL BE	NEFITS				
Elevator Constructor					
1st Term		\$ 33.38		\$ 34.05	
2nd Term		34.20		34.91	
3rd Term		35.55		36.30	
4th Term		36.89		37.70	
Modernization &					
Service/Repair					
1st Term		\$ 33.33		\$ 34.00	
2nd Term		33.82		34.50	
3rd Term		35.09		35.83	
4th Term		36.36		37.15	

. . .

4-1

Elevator Constructor 09/01/2020

JOB DESCRIPTION Elevator Constructor

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Putnam, Sullivan, Ulster

PARTIAL COUNTIES

Delaware: Towns of Andes, Bovina, Colchester, Davenport, Delhi, Harpersfield, Hemdon, Kortright, Meredith, Middletown, Roxbury,

Hancock & Stamford

Rockland: Only the Township of Stony Point.

Westchester: Only the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

 Per Hour
 07/01/2020
 01/01/2021

 Mechanic
 \$ 60.49
 \$62.51

 Helper
 70% of Mechanic Wage Rate
 70% of Mechanic Wage Rate

Four (4), ten (10) hour days may be worked for New Construction and Modernization Work at straight time during a week, Monday thru Thursday or Tuesday thru Friday.

NOTE - In order to use the '4 Day/10 Hour Work Schedule' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule', form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour

07/01/2020 01/01/2021

Journeyperson/Helper

\$ 34.765* \$ 34.825*

(*)Plus 6% of regular hourly if less than 5 years of service. Plus 8% of regular hourly rate if more than 5 years of service.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 16) on HOLIDAY PAGE Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE

Note: When a paid holiday falls on Saturday, it shall be observed on Friday. When a paid holiday falls on Sunday, it shall be observed on Monday.

REGISTERED APPRENTICES

Wages per hour:

0-6 mo* 6-12 mo 2nd yr 3rd yr 4th yr

^{***}Four (4), ten (10) hour days are not permitted for Contract Work/Repair Work

50 % 55 % 65 % 70 % 80 %

(*)Plus 6% of the hourly rate, no additional supplemental benefits.

Supplemental Benefits per hour worked:

Same as Journeyperson/Helper

1-138

Glazier 09/01/2020

JOB DESCRIPTION Glazier DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

 Per hour:
 7/01/2020
 5/31/2021

 Additional

 Glazier
 \$ 57.55
 \$ 2.00

 *Scaffolding
 58.55

 Glass Tinting &
 29.17

 Window Film
 **Repair & Maintenance
 29.17

SUPPLEMENTAL BENEFITS

Per hour:	7/01/2020
Journeyworker	\$ 34.59
Glass tinting &	20.29
Window Film	
Repair & Maintenance	20.29

OVERTIME PAY

See (B,H,V) on OVERTIME PAGE.

For 'Repair & Maintenance' and 'Glass Tinting & Window Film' see (B, B2, I, S) on overtime page.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (4, 6, 16, 25) on HOLIDAY PAGE For 'Repair & Maintenance' and 'Glass Tinting & Window Film' Only

Paid: See(5, 6, 16, 25) Overtime: See(5, 6, 16, 25)

REGISTERED APPRENTICES

Wage per hour:

(1) year terms at the following wage rates:

	7/01/2020
1st term	\$ 20.14
2nd term	28.21
3rd term	34.10
4th term	45.80

Supplemental Benefits:

(Per hour)

(/	
1st term	\$ 16.16
2nd term	22.76
3rd term	25.16
4th term	29.73

8-1087 (DC9 NYC)

Insulator - Heat & Frost 09/01/2020

^{*}Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 24' or more, but not pipe scaffolding.

^{**}Repair & Maintenance- All repair & maintenance work on a particular building, whenever performed, where the total cumulative contract value is under \$148.837. All Glass tinting, window film, regardless of material or intended use, and all affixing of decals to windows or glass.

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Westchester

WAGES

Per hour: 07/01/2020 05/31/2021

Insulator \$ 55.00 \$ 2.00

Discomfort & 57.96

Additional Training**

Fire Stop Work* 29.44

Note: Additional \$0.50 per hour for work 30 feet or more above floor or ground level.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 34.35

Discomfort &

Additional Training 36.30

Fire Stop Work:

Journeyworker 17.52

OVERTIME PAY

See (B, E, E2, Q, *T) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Note: Last working day preceding Christmas and New Years day, workers shall work no later than 12:00 noon and shall receive 8 hrs pay.

Overtime: See (2*, 4, 6, 16, 25) on HOLIDAY PAGE.

*Note: Labor Day triple time if worked.

REGISTERED APPRENTICES

(1) year terms:

Insulator Apprentices:

1st 2nd 3rd 4th \$ 29.44 \$ 34.55 \$ 39.66 \$ 44.78

Discomfort & Additional Training Apprentices:

1st 2nd 3rd 4th \$ 30.99 \$ 36.41 \$ 41.83 \$ 47.26

Supplemental Benefits paid per hour:

Insulator Apprentices:

 1st term
 \$ 17.52

 2nd term
 20.89

 3rd term
 24.25

 4th term
 27.61

Discomfort & Additional Training Apprentices:

 1st term
 \$ 18.50

 2nd term
 22.06

 3rd term
 25.62

 4th term
 29.18

8-91

Ironworker 09/01/2020

^{*} Applies on all exclusive Fire Stop Work (When contract is for Fire Stop work only). No apprentices on these contracts only.

^{**}Applies to work requiring; garb or equipment worn against the body not customarily worn by insulators;psychological evaluation;special training, including but not limited to "Yellow Badge" radiation training

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

 Per Hour:
 07/01/2020
 01/01/2021

 Additional

 Ironworker Rigger
 \$ 67.13
 \$ 1.36

Ironworker Stone

Derrickman \$ 67.13

SUPPLEMENTAL BENEFITS

Per hour: \$ 40.94

OVERTIME PAY

See (B, D1, *E, Q, **V) on OVERTIME PAGE

*Time and one-half shall be paid for all work on Saturday up to eight (8) hours and double time shall be paid for all work thereafter.

** Benefits same premium as wages on Holidays only

HOLIDAY

Paid: See (18) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 25) on HOLIDAY PAGE

*Work stops at schedule lunch break with full day's pay.

REGISTERED APPRENTICES

Wage per hour:

1/2 year terms at the following hourly wage rate:

1st 2nd 3rd 4th 07/01/2020 \$33.12 \$47.19 \$52.50 \$57.82

Supplemental benefits:

Per hour: \$20.93 \$31.23 \$31.23 \$31.23

9-197D/R

Ironworker 09/01/2020

JOB DESCRIPTION Ironworker DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

 Per Hour:
 07/01/2020
 01/01/2021

 Additional

 Ornamental
 \$ 45.65
 \$ 1.25

Chain Link Fence 45.65 Guide Rail 45.65

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: \$58.05

OVERTIME PAY

See (B, B1, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Apprentices hired before 8/31/2018:

(1/2) year terms at the following percentage of Journeyman's wage.

5th Term 80%

Supplemental Benefits per hour:

5th Term 52.38

Apprentices Hired after 9/1/18:

1 year terms

 1st Term
 \$ 21.13

 2nd Term
 24.77

 3rd Term
 36.32

 4th Term
 TBD

Supplemental Benefits per hour:

 1st Term
 \$ 17.61

 2nd Term
 18.86

 3rd Term
 52.58

 4th Term
 TBD

4-580-Or

<u>Ironworker</u> 09/01/2020

JOB DESCRIPTION Ironworker DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES PER HOUR:

07/01/2020 01/01/2021

Ironworker:AdditionalStructural\$ 52.70\$1.75/Hr.

Bridges Machinery

SUPPLEMENTAL BENEFITS

PER HOUR:

Journeyman \$81.35

OVERTIME PAY

See (B, B1, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

6 month terms at the following rate:

1st \$27.45 2nd \$28.05 3rd - 6th \$28.66

Supplemental Benefits

PER HOUR:

All Terms \$56.15

4-40/361-Str

Ironworker 09/01/2020

JOB DESCRIPTION Ironworker DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES

Rockland: Southern section - south of Convent Road and east of Blue Hills Road.

WAGES

Per hour: 07/01/2020

Reinforcing &

Metal Lathing \$ 56.25

"Base" Wage \$ 54.70 plus \$ 1.55

"Base" Wage is used to calculate overtime hours only.

SUPPLEMENTAL BENEFITS

Per hour:

Reinforcing & \$38.30

Metal Lathing

OVERTIME PAY

See (B, E, Q, *X) on OVERTIME PAGE

*Only \$22.00 per Hour for non worked hours

Supplemental Benefit Premiums for Overtime Hours worked:

Time & One Half \$45.08 Double Time \$51.33

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 13, 18, 19, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

Wages Per Hour:

 1st term
 2nd term
 3rd term
 4th Term

 \$ 22.55
 \$ 28.38
 \$ 34.68
 \$ 37.18

SUPPLEMENTAL BENIFITS

Per Hour:

 1st term
 2nd term
 3rd term
 4th Term

 \$ 18.17
 \$ 21.34
 \$ 22.00
 \$ 20.50

4-46Reinf

Laborer - Building 09/01/2020

JOB DESCRIPTION Laborer - Building DISTRICT 8

ENTIRE COUNTIES Putnam, Westchester

WAGES

07/01/2020

Laborer \$35.30

plus \$4.60**

Laborer - Asbestos & Hazardous

Materials Removal \$41.55*

- * Abatement/Removal of:
 - Lead based or lead containing paint on materials to be repainted is classified as Painter.
 - Asbestos containing roofs and roofing material is classified as Roofer.

NOTE: Upgrade/Material condition work plan for work performed during non-outage under a wage formula of 90% wage/100% fringe benefits at nuclear power plants.

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2020

Journeyworker \$ 26.40

OVERTIME PAY

See (B, E, E2, Q, *V) on OVERTIME PAGE

*Note: For Sundays and Holidays worked benefits are at the same premium as wages.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

LABORER ONLY

Hourly terms at the following wage:

 Level A
 Level B
 Level C
 Level D
 Level E

 0-1000
 1001-2000
 2001-3000
 3001-4000
 4001+

 \$ 23.90
 \$ 27.50
 \$ 31.50
 \$ 38.00
 \$ 39.80

^{**} This portion is not subject to overtime premium.

Supplemental Benefits per hour:

aga	rentices
-----	----------

Level A	\$ 12.35
Level B	15.20
Level C	17.80
Level D	18.20
Level E	26.40

8-235/B

Laborer - Heavy&Highway

09/01/2020

JOB DESCRIPTION Laborer - Heavy&Highway

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

WAGES

PUTNAM: APPLIES TO ALL HEAVY & HIGHWAY WORK EXCLUDING HIGHWAYS, STREETS, AND BRIDGES

GROUP I: Blaster and Quarry Master

GROUP II: Burner, Drillers(jumbo, joy, wagon, air track, hydraulic), Drill Operator, Self Contained Rotary Drill, Curbs/ Asphalt Screedman/Raker, Bar Person.

GROUP III: Pavement Breakers, Jeeper Operator, Jack Hammer, Pneumatic Tools (all), Gas Driller, Guniting, Railroad Spike Puller, Pipelayer, Chain Saw, Deck winches on scows, Power Buggy Operator, Power Wheelbarrow Operator, Bar Person Helper.

GROUP IV: Concrete Laborers, Asph. Worker, Rock Scaler, Vibrator Oper., Bit Grinder, Air Tamper, Pumps, Epoxy (adhesives, fillers and troweled on), Barco Rammer, Concrete Grinder, Crack Router Operator, Guide Rail-digging holes and placing concrete and demolition when not to be replaced, distribution of materials and tightening of bolts.

GROUP V: Drillers Helpers, Common Laborer, Mason Tenders, Signal Person, Pit Person, Truck Spotter, Powder Person, Landscape/Nursery Person, Dump Person, Temp. Heat.

GROUP VIA: Asbestos/Toxic Waste Laborer-All removal (Roads, Tunnels, Landfills, etc.) Confined space laborer

Wages:(per hour)	07/01/2020
GROUP I	\$44.45*
GROUP II	43.10*
GROUP III	42.70*
GROUP IV	42.35*
GROUP V	42.00*
GROUP VIA	44.00*
Operator Qualified	
Gas Mechanic	54.45*
Flagperson	35.65*

^{*}NOTE: To calculate overtime premiums, deduct \$0.10 from above wages

SHIFT WORK: A shift premium will be paid on Public Work contracts for off-shift or irregular shift work when mandated by the NYS D.O.T. or other Governmental Agency contracts. Employees shall receive an additional 15% per hour above current rate for all regular and irregular shift work. Premium pay shall be calculated using the 15% per hour differential as base rate.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: First 40 Hours

Per Hour \$24.35

Over 40 Hours

Per Hour 18.10

OVERTIME PAY

See (B, E, P, R, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE Overtime: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

NOTE: For Holiday Overtime: 5, 6 - Code 'S' applies

For Holiday Overtime: 8, 9, 15, 25 - Code 'R' applies

REGISTERED APPRENTICES

1st term 2nd term 3rd term 4th term 1-1000hrs 1001-2000hrs 2001-3000hrs 3001-4000hrs 07/01/2020 \$ 23.90 \$ 28.20 \$ 32.50 \$ 36.70

Supplemental Benefits per hour:

1st term \$ 3.85 - After 40 hours: \$ 3.60 2nd term \$ 3.95 - After 40 hours: \$ 3.60 3rd term \$ 4.45 - After 40 hours: \$ 4.00 4th term \$ 5.00 - After 40 hours: \$ 4.50

8-60H/H

Laborer - Tunnel 09/01/2020

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 11

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Otsego, Putnam, Rockland, Sullivan, Ulster, Westchester

PARTIAL COUNTIES

Chenango: Townships of Columbus, Sherburne and New Berlin.

Delaware: Townships of Andes, Bovina, Middletown, Roxbury, Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield, Merideth and

Davenport.

WAGES

Class 1: All support laborers/sandhogs working above the shaft or tunnel.

Class 2: All laborers/sandhogs working in the shaft or tunnel.

Class 4: Safety Miners

Class 5: Site work related to Shaft/Tunnel

WAGES: (per hour)

	07/01/2020	07/01/2021	07/01/2022
Class 1	\$ 50.45	\$ 51.95	\$ 53.45
Class 2	52.60	54.10	55.60
Class 4	59.00	60.50	62.00
Class 5	42.25	43.50	44.80

Toxic and hazardous waste, lead abatement and asbestos abatement work will be paid an additional \$ 3.00 an hour.

SHIFT DIFFERENTIAL...On all Government mandated irregular shift work:

- Employee shall be paid at time and one half the regular rate Monday through Friday.
- Saturday shall be paid at 1.65 times the regular rate.
- Sunday shall be paid at 2.15 times the regular rate.

SUPPLEMENTAL BENEFITS

Per hour:

Benefit 1	\$ 32.15	\$ 33.25	\$ 34.45
Benefit 2	48.15	49.80	51.60
Benefit 3	64.15	66.35	68.75

Benefit 1 applies to straight time hours, paid holidays not worked.

Benefit 2 applies to over 8 hours in a day (M-F), irregular shift work hours worked, and Saturday hours worked.

Benefit 3 applies to Sunday and Holiday hours worked.

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

When a recognized Holidays falls on Saturday or Sunday, holidays falling on Saturday shall be recognized or observed on Friday and holidays falling on Sunday shall be recognized or observed on Monday. Employees ordered to work on the Saturday or Sunday of the holiday or on the recognized or the observed Friday or Monday for those holidays falling on Saturday or Sunday shall receive double time the established rate and benefits for the holiday.

REGISTERED APPRENTICES

FOR APPRENTICE RATES, refer to the appropriate Laborer Heavy & Highway wage rate contained in the wage schedule for the County and location where the work is to be performed.

11-17/60/235/754Tun

Lineman Electrician 09/01/2020

JOB DESCRIPTION Lineman Electrician

DISTRICT 6

ENTIRE COUNTIES Westchester

WAGES

Below rates apply to electrical overhead and underground distribution and maintenance work and overhead and underground transmission line work, electrical substations, switching structures, continuous pipe-type underground fluid or gas filled transmission conduit and cable installations, maintenance jobs or projects, railroad catenary installations and maintenance, third rail installations, the bonding of rails and the installation of fiber optic cable. (Ref #14.04.01)

Includes Teledata Work performed within ten (10) feet of high voltage (600 volts or over) transmission lines.

Per hour:	07/01/2020
Lineman, Tech, Welder	\$ 56.51
Crane, Crawler Backhoe	56.51
Cable Splicer-Pipe Type	62.16
Digging Mach Operator	50.86
Cert. Welder-Pipe Type	59.34
Tractor Trailer Driver	48.03
Groundman, Truck Driver	45.21
Equipment Mechanic	45.21
Flagman	33.91

Additional \$1.00 per hour for entire crew when a helicopter is used.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM	REGULAR RATE
2ND SHIET	1:30 DM TO 1:00 AM	RECLUAR RATE PLUS

2ND SHIFT 4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3% 3RD SHIFT 12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

Journeyman \$ 24.90 *plus 6.75% of hourly wage

OVERTIME PAY

See (B, E, Q,) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept of Jurisdiction.

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

Overtime See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms.

^{*}The 6.75% is based on the hourly wage paid, straight time or premium time.

1st term	\$ 33.91
2nd term	36.73
3rd term	39.56
4th term	42.38
5th term	45.21
6th term	48.03
7th term	50.86

SUPPLEMENTAL BENEFITS per hour: Same as Journeyman

6-1249aWest

Lineman Electrician - Teledata

09/01/2020

JOB DESCRIPTION Lineman Electrician - Teledata

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour:

For outside work, stopping at first point of attachment (demarcation).

	07/01/2020	01/01/2021
Cable Splicer	\$ 33.77	\$ 34.78
Installer, Repairman	\$ 32.05	\$ 33.01
Teledata Lineman	\$ 32.05	\$ 33.01
Tech., Equip. Operator	\$ 32.05	\$ 33.01
Groundman	\$ 16.99	\$ 17.50

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED:

1ST SHIFT REGULAR RATE

2ND SHIFT REGULAR RATE PLUS 10% 3RD SHIFT REGULAR RATE PLUS 15%

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 5.06 \$ 5.06 *plus 3% of *plus 3% of wage paid wage paid

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE

6-1249LT - Teledata

Lineman Electrician - Traffic Signal, Lighting

09/01/2020

JOB DESCRIPTION Lineman Electrician - Traffic Signal, Lighting

DISTRICT 6

ENTIRE COUNTIES

Westchester

WAGES

^{*}The 3% is based on the hourly wage paid, straight time rate or premium rate.

Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors which includes, but is not limited to road loop wires; conduit and plastic or other type pipes that carry conductors, flex cables and connectors, and to oversee the encasement or burial of such conduits or pipes.

A Groundman/Groundman Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only. (Ref #14.01.03)

Per hour:	07/01/2020
Lineman, Technician	\$ 51.61
Crane, Crawler Backhoe	51.61
Certified Welder	54.19
Digging Machine	46.45
Tractor Trailer Driver	43.87
Groundman, Truck Driver	41.29
Equipment Mechanic	41.29
Flagman	30.97

Above rates are applicable for installation, testing, operation, maintenance and repair on all Traffic Control (Signal) and Illumination (Lighting) projects, Traffic Monitoring Systems, and Road Weather Information Systems. Includes digging of holes for poles, anchors, footer foundations for electrical equipment; assembly of all electrical materials or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT 8:00 AM TO 4:30 PM REGULAR RATE

 2ND SHIFT
 4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%

 3RD SHIFT
 12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

Journeyman \$24.90 *plus 6.75% of hourly wage

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept. of Jurisdiction.

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day. Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms.

^{*}The 6.75% is based on the hourly wage paid, straight time rate or premium rate. Supplements paid at STRAIGHT TIME rate for holidays.

1st term	\$ 30.97
2nd term	33.55
3rd term	36.13
4th term	38.71
5th term	41.29
6th term	43.87
7th term	46.45

SUPPLEMENTAL BENEFITS per hour: Same as Journeyman

6-1249aWestLT

Mason - Building 09/01/2020

JOB DESCRIPTION Mason - Building **DISTRICT** 9

ENTIRE COUNTIES

Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2020 12/07/2020 Additional \$0.88 Tile Setters \$60.09

SUPPLEMENTAL BENEFITS

Per Hour:

\$ 24.81* + \$9.72

4th

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

Work beyond 10 hours on Saturday shall be paid at double the hourly wage rate.

Paid:

See (1) on HOLIDAY PAGE See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE Overtime:

3rd

REGISTERED APPRENTICES

Wage per hour:

Tile Setters:

Term:

1st

(750 hour) term at the following wage rate:

2nd

1- 750	751- 1500	1501- 2250	2251- 3000	3001- 3750	3751- 4500	4501- 5250	5251- 6000	6001- 6750	6501- 7000
07/01/2020 \$20.35	\$25.11	\$32.09	\$36.83	\$40.25	\$43.50	\$46.95	\$51.69	\$54.34	\$58.19
Supplementa	al Benefits per	hour:							
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$12.55* +\$.66	\$12.55* +\$.70	\$15.06* +\$.80	\$15.06* +\$.85	\$16.06* +\$1.23	\$17.56* +\$1.27	\$18.56* +\$1.62	\$18.56* +\$1.67	\$16.56* +\$5.82	\$21.81* +\$6.31

6th

5th

7th

8th

DISTRICT 11

9th

9-7/52A

10th

09/01/2020 Mason - Building

JOB DESCRIPTION Mason - Building

ENTIRE COUNTIES

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES Per hour:

^{*} This portion of benefits subject to same premium rate as shown for overtime wages.

^{*} This portion of benefits subject to same premium rate as shown for overtime wages.

07/01/2020

Bricklayer \$ 42.09 Cement Mason 42.09 Plasterer/Stone Mason 42.09 Pointer/Caulker 42.09

Additional \$1.00 per hour for power saw work

Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:

Irregular work day requires 15% premium

Second shift an additional 15% of wage plus benefits to be paid Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$35.00

OVERTIME PAY

OVERTIME:

Cement Mason See (B, E, Q, W) on OVERTIME PAGE.

All Others See (B, E, Q) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE Overtime: See (5, 6) on HOLIDAY PAGE

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

6th 7th 1st 2nd 3rd 4th 5th 8th 60% 65% 70% 75% 80% 50% 55% 85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st 2nd 3rd 4th 5th 6th 7th 8th 50% 55% 60% 65% 70% 75% 80% 85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5wp-b

Mason - Building 09/01/2020

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Building:

07/01/2020 01/01/2021
Wages per hour: Additional \$0.95

Mosaic & Terrazzo Mechanic \$57.42

Mosaic & Terrazzo Finisher \$55.82

SUPPLEMENTAL BENEFITS

Per hour:

Mosaic & Terrazzo Mechanic \$ 25.61*

+ \$11.47

Mosaic & Terrazzo Finisher \$ 25.61*

+ \$11.45

*This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (A, E, Q) on OVERTIME PAGE

Deduct \$6.60 from hourly wages before calculating overtime.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

Easter Sunday is an observed holiday. Holidays falling on a Saturday will be observed on that Saturday. Holidays falling on a Sunday will be celebrated on the Monday.

REGISTERED APPRENTICES

Wages per hour:

(750 Hour) terms at the following wage rate.

07/01/2020	1st	2nd	3rd	4th	5th	6th	7th	8th
	\$25.40	\$27.94	\$30.49	\$33.03	\$35.57	\$38.11	\$43.20	\$48.28
Supplemental benefits per ho	ur:							
07/01/2020	\$ 12.81* +\$9.04	\$ 14.09* +\$9.94	\$ 15.37* +\$10.84	\$ 16.65* +\$11.75	\$ 17.93* +\$12.65	\$ 19.21* +\$13.55	\$ 21.77* +\$15.36	\$ 24.33* +\$17.16

Apprentices hired after 07/01/2017:

Wages Per hour:

	1st	2nd	3rd	4th	5th	6th
	0-	1501-	3001-	3751-	4501-	5251-
	1500	3000	3750	4500	5250	6000
07/01/2020	\$22.20	\$22.88	\$30.49	\$35.57	\$40.65	\$45.73
Supplemental Benefits per l	hour:					
07/01/2020	1st	2nd	3rd	4th	5th	6th
	\$4.55*	\$11.52*	\$15.37*	\$17.93*	\$20.49*	\$23.05*
	+\$6.32	+\$8.13	+\$10.84	+\$12.65	+\$14.46	+\$16.22

^{*}This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/3

DISTRICT 9

Mason - Building	09/01/2020

JOB DESCRIPTION Mason - Building

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2020 01/01/2021

Building-Marble Restoration: Additional \$1.10

Marble, Stone & \$44.66

Terrazzo Polisher, etc

SUPPLEMENTAL BENEFITS

Per Hour: Journeyworker:

Building-Marble Restoration:

Marble, Stone &

Polisher \$ 28.41

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*ON SATURDAYS, 8TH HOUR AND SUCCESSIVE HOURS PAID AT DOUBLE HOURLY RATE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE 1ST TERM APPRENTICE GETS PAID FOR ALL OBSERVED HOLIDAYS.

REGISTERED APPRENTICES

WAGES per hour:

900 hour term at the following wage:

 1st
 2nd
 3rd
 4th

 1 901 1801 2701

 900
 1800
 2700

07/01/2020 \$31.19 \$35.68 \$40.16 \$44.66

Supplemental Benefits Per Hour:

07/01/2020 \$ 25.78 \$ 26.66 \$ 27.54 \$ 28.41

9-7/24-MP

Mason - Building 09/01/2020

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Wages: 07/01/2020 01/14/2021

Additional

7th

Marble Cutters & Setters \$60.35 \$0.95

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 37.24

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

1st

Paid: See (1) on HOLIDAY PAGE

3rd

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

4th

REGISTERED APPRENTICES

2nd

Wage Per Hour:

750 hour terms at the following wage.

1-751-1501-2251-3001-3751-4501-5251-6001-6751-750 1500 2250 3000 3750 4500 5250 6000 6751 7500 07/01/2020 \$24.15 \$27.15 \$30.16 \$33.19 \$36.20 \$39.20 \$42.15 \$45.26 \$51.28 \$57.34

6th

5th

Supplemental Benefits per hour:

3rd 1st 2nd 4th 5th 6th 7th 8th 9th 10th \$27.29 \$32.98 \$20.14 \$21.58 \$23.02 \$24.42 \$25.85 \$28.72 \$30.12 \$35.81

9-7/4

Mason - Building 09/01/2020

JOB DESCRIPTION Mason - Building

ENTIRE COUNTIES

Nassau, Rockland, Suffolk, Westchester

Page 41

DISTRICT 9

8th

9th

10th

WAGES

Per hour: 07/01/2020 12/07/2020 Additional

Tile Finisher \$ 46.21 \$0.73

SUPPLEMENTAL BENEFITS

Per Hour:

\$ 21.56* + \$9.65

*This portion of benefits subject to same premium rate as shown for overtime wages

OVERTIME PAY

See (B, E, Q, *V) on OVERTIME PAGE

Work beyond 10 hours on a Saturday shall be paid at double the hourly wage rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88A-tf

Mason - Building 09/01/2020

JOB DESCRIPTION Mason - Building DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2020 01/01/2021

Marble, Stone, etc.

Additional
Maintenance Finishers: \$ 25.53 \$0.68

Note 1: An additional \$2.00 per hour for time spent grinding floor using "60 grit" and below.

Note 2: Flaming equipment operator shall be paid an additional \$25.00 per day.

SUPPLEMENTAL BENEFITS

Per Hour:

Marble, Stone, etc

Maintenance Finishers: \$ 13.85

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*Double hourly rate after 8 hours on Saturday

HOLIDAY

Paid: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE

1st term apprentice gets paid for all observed holidays.

REGISTERED APPRENTICES

WAGES per hour:

 07/01/2020

 0-750
 \$17.87

 751-1500
 \$18.89

 1501-2250
 \$19.92

 2251-3000
 \$20.93

 3001-3750
 \$22.47

 3751-4500
 \$24.51

 4501+
 \$25.53

Supplemental Benefits:

Per hour:

 0-750
 \$ 13.73

 751-1500
 \$ 13.75

 1501-2250
 \$ 13.76

 2251-3000
 \$ 13.78

DISTRICT 9

DISTRICT 11

3001-3750 \$ 13.80 3751-4500 \$ 13.83 4501+ \$ 13.85

9-7/24M-MF

Mason - Building / Heavy&Highway

09/01/2020

JOB DESCRIPTION Mason - Building / Heavy&Highway

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2020 01/14/2021

Additional

Marble-Finisher \$47.92 \$0.61

SUPPLEMENTAL BENEFITS

Journeyworker: per hour

Marble- Finisher \$ 34.99

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

* Work beyond 8 hours on a Saturday shall be paid at double the rate.

** When an observed holiday falls on a Sunday, it will be observed the next day.

9-7/20-MF

Mason - Heavy&Highway

09/01/2020

JOB DESCRIPTION Mason - Heavy&Highway

ENTIRE COUNTIES

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES Per hour:

07/01/2020

 Bricklayer
 \$ 42.60

 Cement Mason
 42.60

 Marble/Stone Mason
 42.60

 Plasterer
 42.60

 Pointer/Caulker
 42.60

Additional \$1.00 per hour for power saw work

Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:

Irregular work day requires 15% premium

Second shift an additional 15% of wage plus benefits to be paid Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 34.99

OVERTIME PAY

 $\begin{array}{ll} \text{Cement Mason} & \text{See (B, E, Q, W, X)} \\ \text{All Others} & \text{See (B, E, Q, X)} \\ \end{array}$

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE Overtime: See (5, 6, 15, 25) on HOLIDAY PAGE

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

7th 1st 2nd 3rd 4th 5th 6th 8th 50% 55% 60% 65% 70% 75% 80% 85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st 2nd 3rd 4th 5th 6th 7th 8th 50% 55% 60% 65% 70% 75% 80% 85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5WP-H/H

Operating Engineer - Building

09/01/2020

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Putnam, Queens, Richmond, Westchester

PARTIAL COUNTIES

Dutchess: that part of Dutchess County lying south of the North City Line of the City of Poughkeepsie.

WAGES

NOTE: Construction surveying

Party chief--One who directs a survey party

Instrument Man--One who runs the instrument and assists Party Chief.

Rodman--One who holds the rod and assists the Survey Crew

Wages:(Per Hour) 07/01/2020

Building Construction:

Party Chief \$74.75 Instrument Man \$59.53 Rodman \$40.79

Steel Erection:

Party Chief \$ 78.44 Instrument Man \$ 62.74

Rodman \$ 44.39

Heavy Construction-NYC counties only:

(Foundation, Excavation.)

Party Chief \$83.87 Instument man \$63.61 Rodman \$54.59

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2020

Building Construction & \$ 22.85* + 6.90

Steel

Heavy Construction \$23.10* + 6.90

Non-Worked Holiday Supplemental Benefit:

\$ 16.45

^{*} This portion subject to same premium as wages

OVERTIME PAY

See (A, B, E, Q) on OVERTIME PAGE

Code "A" applies to Building Construction and has double the rate after 7 hours on Saturdays.

Code "B" applies to Heavy Construction and Steel Erection and had double the rate after 8 hours on Saturdays.

HOLIDAY

Paid: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE Overtime: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

9-15Db

Operating Engineer - Building

09/01/2020

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I:

Cranes (All Types up to 49 tons), Boom Trucks, Cherry Pickers (All Types), Clamshell Crane, Derrick (Stone and Steel), Dragline, Franki Pile Rig or similar, High Lift (Lull or similar) with crane attachment and winch used for hoisting or lifting, Hydraulic Cranes, Pile Drivers, Potain and similar.

Cranes (All types 50-99 tons), Drill Rig Casa Grande (CAT or similar), Franki Pile Rig or similar, Hydraulic Cranes (All types including Crawler Cranes- No specific boom length).

Cranes (All types 100 tons and over), All Tower Cranes, All Climbing Cranes irrespective of manufacturer and regardless of how the same is rigged, Franki Pile Rig or similar, Conventional Cranes (All types including Crawler Cranes-No specific boom length), Hydraulic Cranes.

GROUP I-A: Barber Green Loader-Euclid Loader, Bulldozer, Carrier-Trailer Horse, Concrete Cleaning Decontamination Machine Operator, Concrete-Portable Hoist, Conway or Similar Mucking Machines, Elevator & Cage, Excavators all types, Front End Loaders, Gradall, Shovel, Backhoe, etc. (Crawler or Truck), Heavy Equipment Robotics Operator/Mechanic, Hoist Engineer-Material, Hoist Portable Mobile Unit, Hoist(Single, Double or Triple Drum), Horizontal Directional Drill Locator, Horizontal Directional Drill Operator and Jersey Spreader, Letourneau or Tournapull(Scrapers over 20 yards Struck), Lift Slab Console, etc., Lull HiLift or Similar, Master Environmental Maintenance Mechanics, Mucking Machines Operator/Mechanic or Similar Type, Overhead Crane, Pavement Breaker(Air Ram), Paver(Concrete), Post Hole Digger, Power House Plant, Road Boring Machine, Road Mix Machine, Ross Carrier and Similar Machines, Rubber tire double end backhoes and similar machines, Scoopmobile Tractor-Shovel Over 1.5 yards, Shovel (Tunnels), Spreader (Asphalt) Telephie(Cableway), Tractor Type Demolition Equipment, Trenching Machines-Vermeer Concrete Saw Trencher and Similar, Ultra High Pressure Waterjet Cutting Tool System, Vacuum Blasting Machine operator/mechanic, Winch Truck A Frame.

GROUP I-B: Compressor (Steel Erection), Mechanic (Outside All Types), Negative Air Machine (Asbestos Removal), Push Button (Buzz Box) Elevator.

GROUP II: Compactor Self-Propelled, Concrete Pump, Crane Operator in Training (Over 100 Tons), Grader, Machines Pulling Sheep's Foot Roller, Roller (4 ton and over), Scrapers (20 yards Struck and Under), Vibratory Rollers, Welder.

GROUP III-A: Asphalt Plant, Concrete Mixing Plants, Forklift (All power sources), Joy Drill or similar, Tractor Drilling Machine, Loader (1 1/2 yards and under), Portable Asphalt Plant, Portable Batch Plant, Portable Crusher, Skid Steer (Bobcat or similar), Stone Crusher, Well Drilling Machine, Well Point System.

GROUP III-B: Compressor Over 125 cu.Feet, Conveyor Belt Machine regardless of size, Compressor Plant, Ladder Hoist, Stud Machine.

GROUP IV-A: Batch Plant, Concrete Breaker, Concrete Spreader, Curb Cutter Machine, Finishing Machine-Concrete, Fine Grading Machine, Hepa Vac Clean Air Machine, Material Hopper(sand, stone, cement), Mulching Grass Spreader, Pump Gypsum etc, Pump-Plaster-Grout-Fireproofing. Roller(Under 4 Ton), Spreading and Fine Grading Machine, Steel Cutting Machine, Siphon Pump, Tar Joint Machine, Television Cameras for Water, Sewer, Gas etc. Turbo Jet Burner or Similar Equipment, Vibrator (1 to 5).

GROUP IV-B: Compressor (all types), Heater (All Types), Fire Watchman, Lighting Unit (Portable & Generator) Pump, Pump Station(Water, Sewer, Portable, Temporary), Welding Machine (Steel Erection & Excavation).

GROUP V: Mechanics Helper, Motorized Roller (walk behind), Stock Attendant, Welder's Helper.

GROUP VI-B: Utility Man, Warehouse Man.

WAGES: (per hour)	
,	07/01/2020
GROUP I	
Cranes- up to 49 tons	\$ 61.70
Cranes- 50 tons to 99 tons	63.86
Cranes- 100 tons and over	72.99
GROUP I-A	53.95
GROUP I-B	49.68
GROUP II	52.03
GROUP III-A	50.11
GROUP III-B	47.67
GROUP IV-A	49.60
GROUP IV-B	41.85
GROUP V	45.17
GROUP VI-A	52.96
GROUP VI-B	
Utility Man	42.83
Warehouse Man	44.92

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects.

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour.

Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour.

Loader operators over 5 cubic yard capacity additional .50 per hour.

Shovel operators over 4 cubic yard capacity additional \$1.00 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

07/01/2020 \$ 28.52

OVERTIME PAY

Journeyworker

OVERTIME:..... See (B, E,P,R*,T**,U***,V) on OVERTIME PAGE.

HOLIDAY

Paid:....... See (5, 6, 11, 12, 15, 25) on HOLIDAY PAGE. Overtime:.... See (5, 6, 11, 12, 15, 25) on HOLIDAY PAGE.

8-137B

Operating Engineer - Heavy&Highway

09/01/2020

DISTRICT 8

JOB DESCRIPTION Operating Engineer - Heavy&Highway

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane, (Crawler, Truck),

Dragline, Drill Rig (Casa Grande, Cat, or Similar), Floating Crane (Crane on Barges) under 100 tons, Gin Pole, Hoist Engineer-Concrete (Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger (Truck or Truck Mounted), Boat Captain, Bulldozer-All Sizes, Central Mix Plant Operator, Chipper (all types), Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader (Motor Grader), Elevator & Cage (Materials or Passenger), Excavator (and all attachments), Front End Loaders (1 1/2 yards and over), High Lift Lull and similar, Hoist (Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer (Material), Jack and Bore Machine, Log Skidders, Mill Machines, Mucking Machines, Overhead Crane, Paver (concrete), Post Pounder (of any type), Push Cats, Road Reclaimer, Robot Hammer (Brokk or similar), Robotic Equipment (Scope of Engineer Schedule), Ross Carrier and similar, Scrapers (20 yard struck and over), Side Boom, Slip Form Machine, Spreader (Asphalt), Trenching Machines (Telephies-Vermeer Concrete Saw), Tractor Type Demolition Equipment, Vacuum Truck.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver (Asphalt).

^{*} For Holiday codes 11, 12, 15, 25, code R applies.

^{**} For Holiday code 28, code T applies

^{***} For Holiday codes 5 & 6, code U applies

GROUP II-A: Ballast Regulators, Compactor Self Propelled, Fusion Machine, Rail Anchor Machines, Roller (4 ton and over), Scrapers (20 yard struck and under), Vibratory Roller (Riding), Welder.

GROUP II-B: Mechanic (Outside) All Types.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler (High Pressure), Concrete Breaker (Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift (all types), Gas Tapping (Live), Hydroseeder, Loader (1 1/2 yards and under), Locomotive (all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher (Apprentice), Powerhouse Plant, Roller (under 4 ton), Sheer Excavator, Skid Steer/Bobcat, Stone Crusher, Sweeper (with seat), Well Drilling Machine.

GROUP IV: Service Person (Grease Truck).

GROUP IV-B: Conveyor Belt Machine (Truck Mounted), Heater (all types), Lighting Unit (Portable), Maintenance Engineer (For Crane Only), Mechanics Helper, Pump (Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck (Sewer Jet or Similar), Welders Helper, Welding Machine (Steel Erection), Well Point System.

GROUP V: All Tower Cranes-All Climbing Cranes and all cranes of 100-ton capacity or greater (3900 Manitowac or similar) irrespective of manufacturer and regardless of how the same is rigged, Hoist Engineer (Steel), Engineer-Pile Driver, Jersey Spreader, Pavement Breaker/Post Hole Digger.

WAGES: Per hour:	07/01/2020
Group I	\$ 62.38
Group I-A	54.95
Group I-B	57.92
Group II-A	52.61
Group II-B	54.26
Group III	51.68
Group IV-A	46.93
Group IV-B	40.24
Group V-A	
Engineer All Tower, Climbing and	
Cranes of 100 Tons	70.72
Hoist Engineer(Steel)	64.00
Engineer(Pile Driver)	68.27
Jersey Spreader, Pavement Breaker (Air	
Ram)Post Hole Digger	53.83

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts on all government mandated off-shift work

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour over the rate listed in the Wage Schedule. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour over the rate listed in the Wage Schedule. Loader and Excavator Operators: over 5 cubic yards capacity \$0.50 per hour over the rate listed in the Wage Schedule. Shovel Operators: over 4 cubic yards capacity \$1.00 per hour over the rate listed in the Wage Schedule.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday; Friday may be used as a make-up day.

NOTE - In order to use the 4 Day/10 Hour Work scheduleRegistration for Use of 4 Day/10 Hour Work Schedule,form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: 07/01/2020

\$ 30.50 up to 40 Hours

After 40 hours \$ 21.35* PLUS \$ 1.15 on all hours worked

^{*}This amount is subject to premium

DISTRICT 9

See (B, E, E2, P, *R, **U) on OVERTIME PAGE

HOLIDAY

Paid:...... See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE Overtime.... See (5, 6, 8, 9, 15, 25) on OVERTIME PAGE

- * For Holiday codes 8,9,15,25 code R applies
- ** For Holiday Codes 5 & 6 code U applies

Note: If employees are required to work on Easter Sunday they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1) year terms at the following rate.

07/01/2020

 1st term
 \$ 27.48

 2nd term
 32.97

 3rd term
 38.47

 4th term
 43.96

Supplemental Benefits per hour:

\$ 22.50

8-137HH

Operating Engineer - Heavy&Highway

09/01/2020

JOB DESCRIPTION Operating Engineer - Heavy&Highway

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: South of the North city line of Poughkeepsie

WAGES

Party Chief - One who directs a survey party

Instrument Man - One who runs the instrument and assists Party Chief Rodman - One who holds the rod and in general, assists the Survey Crew

Catorgories cover GPS & Underground Surveying

Per Hour: 07/01/2020

Party Chief \$81.06

Instrument Man 61.32 Rodman 52.53

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2020

All Catorgories

Straight Time: \$ 23.10* plus \$6.90

Premium:

Time & 1/2 \$ 34.65* plus \$6.90

Double Time \$ 46.20* plus \$6.90

Non-Worked Holiday Supplemental Benefits:

\$ 16.45

OVERTIME PAY

See (B, *E, Q) on OVERTIME PAGE

* Doubletime paid on all hours in excess of 8 hours on Saturday

HOLIDAY

Paid: See (5, 6, 7, 11, 12) on HOLIDAY PAGE Overtime: See (5, 6, 7, 11, 12) on HOLIDAY PAGE

9-15Dh

Operating Engineer - Heavy&Highway - Tunnel

09/01/2020

JOB DESCRIPTION Operating Engineer - Heavy&Highway - Tunnel

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane(Crawler, Truck), Dragline, Drill Rig Casa Grande(Cat or Similar), Floating Crane(Crane on Barge-Under 100 Tons), Hoist Engineer(Concrete/Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger(Truck or Truck Mounted), Boat Captain, Bull Dozer-all sizes, Central Mix Plant Operator, Chipper-all types, Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader(Motor Grader), Elevator & Cage(Materials or Passengers), Excavator(and all attachments), Front End Loaders(1 1/2 yards and over), High Lift Lull, Hoist(Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer(Material), Jack and Bore Machine, Log Skidder, Milling Machine, Moveable Concrete Barrier Transfer & Transport Vehicle, Mucking Machines. Overhead Crane, Paver(Concrete), Post Pounder of any type, Push Cats, Road Reclaimer, Robot Hammer(Brokk or similar), Robotic Equipment(Scope of Engineer Schedule), Ross Carrier and similar machines, Scrapers(20 yards struck and over), Side Boom, Slip Form Machine, Spreader(Asphalt), Trenching Machines, Telephies-Vermeer Concrete Saw, Tractor type demolition equipment, Vacuum Truck.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver(Asphalt).

GROUP II-A: Ballast Regulators, Compactor(Self-propelled), Fusion Machine, Rail Anchor Machines, Roller(4 ton and over), Scrapers(20 yard struck and under), Vibratory Roller(riding), Welder.

GROUP II-B: Mechanic(outside)all types.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler(High Pressure), Concrete Breaker(Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift(all types of power), Gas Tapping(Live), Hydroseeder, Loader(1 1/2 yards and under), Locomotive(all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher(Apprentice), Powerhouse Plant, Roller(under 4 ton), Sheer Excavator, Skidsteer/Bobcat, Stone Crusher, Sweeper(with seat), Well Drilling Machine.

GROUP IV-A: Service Person(Grease Truck).

GROUP IV-B: Conveyor Belt Machine(Truck Mounted), Heater(all types), Lighting Unit(Portable), Maintenance Engineer(for Crane only), Mechanics Helper, Pump(Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck(Sewer Jet or similar), Welding Machine(Steel Erection), Welders Helper.

GROUP V-A: Engineer(all Tower Cranes, all Climbing Cranes & all Cranes of 100 ton capacity or greater), Hoist Engineer(Steel-Sub Structure), Engineer-Pile Driver, Jersey-Spreader, Pavement breaker, Post Hole Digger

WAGES: (per hour)

07/01/2020
\$ 62.38
54.95
57.92
52.61
54.26
51.68
46.93
40.24
70.72
68.27
64.00
53.83
53.83
53.83

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts on all government mandated off-shift work

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects. Operators required to use two buckets pouring concrete on other than road pavement shall receive \$0.50 per hour over scale. Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour. Operators of shovels with a capacity over (4) cubic yards shall be paid an additional \$1.00 per hour. Operators of loaders with a capacity over (5) cubic yards shall be paid an additional \$0.50 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:

07/01/2020

\$ 22.50 + \$8.00 (Limited to first 40 hours)

OVERTIME PAY

See (D, O, *U, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE Overtime: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

* Note: For Holiday codes 5 & 6, code U applies.

Note: If employees are required to work on Easter Sunday, they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1) year terms at the following rates:

	07/01/202
1st term	\$ 27.48
2nd term	32.97
3rd term	38.47
4th term	43.96

Supplemental Benefits per hour:

07/01/2020

All terms \$ 22.50

8-137Tun

Operating Engineer - Marine Dredging

09/01/2020

DISTRICT 4

JOB DESCRIPTION Operating Engineer - Marine Dredging

ENTIRE COUNTIES

Albany, Bronx, Cayuga, Chautauqua, Clinton, Columbia, Dutchess, Erie, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Niagara, Orange, Orleans, Oswego, Putnam, Queens, Rensselaer, Richmond, Rockland, St. Lawrence, Suffolk, Ulster, Washington, Wayne, Westchester

WAGES

These wages do not apply to Operating Engineers on land based construction projects. For those projects, please see the Operating Engineer Heavy/Highway Rates. The wage rates below for all equipment and operators are only for marine dredging work in navigable waters found in the counties listed above.

Per Hour: 07/01/2020 10/01/2020

CLASS A1 \$40.31 \$41.42

Deck Captain, Leverman

Mechanical Dredge Operator

Licensed Tug Operator 1000HP or more.

CLASS A2 35.92 36.91

Crane Operator (360 swing)

CLASS B To conform to Operating Engineer
Dozer,Front Loader Prevailing Wage in locality where work
Operator on Land is being performed including benefits.

CLASS B1 34.86 35.82

Derrick Operator (180 swing) Spider/Spill Barge Operator Operator II, Fill Placer,

33.72

32.80

Engineer, Chief Mate, Electrician, Chief Welder, Maintenance Engineer Licensed Boat, Crew Boat Operator CLASS B2 32.82 Certified Welder CLASS C1 31.92 Drag Barge Operator, Steward, Mate, Assistant Fill Placer CLASS C2 30.89 **Boat Operator**

31.74

CLASS D 25.66 26.37

Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor

SUPPLEMENTAL BENEFITS

Per Hour:

THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

07/01/2020 10/01/2020 All Classes A & B \$11.58 plus 7.5% \$11.98 plus 8% of straight time of straight time wage, Overtime hours wage, Overtime hours

> add \$ 0.63 add \$ 0.63

All Class C \$11.28 plus 7.5% 11.68 plus 8% of straight time of straight time

> wage. Overtime hours wage. Overtime hours

add \$ 0.48 add \$ 0.48

\$10.98 plus 7.5% All Class D 11.38 plus 8% of straight time of straight time

> wage, Overtime hours wage, Overtime hours

add \$ 0.33 add \$ 0.33

OVERTIME PAY

See (B2, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

See (5, 6, 8, 15, 26) on HOLIDAY PAGE Overtime:

4-25a-MarDredge

Operating Engineer - Survey Crew - Consulting Engineer

09/01/2020

JOB DESCRIPTION Operating Engineer - Survey Crew - Consulting Engineer **DISTRICT** 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES

Dutchess: That part in Duchess County lying South of the North City line of Poughkeepsie.

Feasibility and preliminary design surveying, any line and grade surveying for inspection or supervision of construction.

07/01/2020 Per hour:

Survey Classifications

Party Chief \$ 45.32 Instrument Man 37.85 Rodman 33.14

SUPPLEMENTAL BENEFITS

Per Hour:

All Crew Members: \$ 19.50

OVERTIME PAY

OVERTIME:.... See (B, E*, Q, V) ON OVERTIME PAGE. *Doubletime paid on the 9th hour on Saturday.

HOLIDAY

Paid: See (5, 6, 7, 11, 16) on HOLIDAY PAGE
Overtime: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

9-15dconsult

Painter	09/01/2020

JOB DESCRIPTION Painter DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2020

Brush \$49.20*

Abatement/Removal of lead based 49.20*

or lead containing paint on materials to be repainted.

 Spray & Scaffold
 \$ 52.20*

 Fire Escape
 52.20*

 Decorator
 52.20*

 Paperhanger/Wall Coverer
 51.96*

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2020

 Paperhanger
 \$ 30.70

 All others
 28.81

 Premium
 32.10**

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rate.

Per hour:	07/01/2020
Appr 1st term	\$ 19.12*
Appr 2nd term	24.52*
Appr 3rd term	29.72*
Appr 4th term	39.75*

^{*}Subtract \$ 0.10 to calculate premium rate.

Supplemental benefits:

 Per Hour:
 07/01/2020

 Appr 1st term...
 \$ 14.32

 Appr 2nd term...
 17.78

 Appr 3rd term...
 20.50

 Appr 4th term...
 25.89

8-NYDC9-B/S

Painter 09/01/2020

^{*}Subtract \$ 0.10 to calculate premium rate.

^{**}Applies only to "All others" category, not paperhanger journeyworker.

ENTIRE COUNTIES

Putnam, Suffolk, Westchester

PARTIAL COUNTIES

Nassau: All of Nassau except the areas described below: Atlantic Beach, Ceaderhurst, East Rockaway, Gibson, Hewlett, Hewlett Bay, Hewlett Neck, Hewlett Park, Inwood, Lawrence, Lido Beach, Long Beach, parts of Lynbrook, parts of Oceanside, parts of Valley Stream, and Woodmere. Starting on the South side of Sunrise Hwy in Valley Stream running east to Windsor and Rockaway Ave., Rockville Centre is the boundary line up to Lawson Blvd. turn right going west all the above territory. Starting at Union Turnpike and Lakeville Rd. going north to Northern Blvd. the west side of Lakeville road to Northern blvd. At Northern blvd. going east the district north of Northern blvd. to Port Washington Blvd. West of Port Washington blvd.to St.Francis Hospital then north of first traffic light to Port Washington and Sands Point, Manor HAven, Harbour Acres.

WAGES

Per hour: 07/01/2020 Drywall Taper \$ 49.20*

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2020 Journeyman \$ 28.81

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages - Per Hour: 07/01/2020

1500 hour terms at the following wage rate:

 1st term
 \$ 19.12*

 2nd term
 24.52*

 3rd term
 29.72*

 4th term
 39.75*

Supplemental Benefits - Per hour:

One year term (1500 hours) at the following dollar amount.

 1st year
 \$ 14.32

 2nd year
 17.78

 3rd year
 20.40

 4th year
 25.89

8-NYDCT9-DWT

Painter - Bridge & Structural Steel

09/01/2020

DISTRICT 8

JOB DESCRIPTION Painter - Bridge & Structural Steel

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per Hour: STEEL:

Bridge Painting:

07/01/2020 10/01/2020 10/01/2021 \$ 50.25 \$ 51.50 \$ 53.00 + 7.88* + 8.63* + 9.63*

ADDITIONAL \$6.00 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

NOTE: All premium wages are to be calculated on base rate per hour only.

^{*}Subtract \$ 0.10 to calculate premium rate.

^{*}Subtract \$ 0.10 to calculate premium rate.

^{*} For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

NOTE: Generally, for Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter's Rate; the contract must be ONLY for Bridge Painting.

SHIFT WORK:

When directly specified in public agency or authority contract documents for an employer to work a second shift and works the second shift with employees other than from the first shift, all employees who work the second shift will be paid 10% of the base wage shift differential in lieu of overtime for the first eight (8) hours worked after which the employees shall be paid at time and one half of the regular wage rate. When a single irregular work shift is mandated in the job specifications or by the contracting agency, wages shall be paid at time and one half for single shifts between the hours of 3pm-11pm or 11pm-7am.

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker: 07/01/2020 10/01/2020 10/01/2021 \$ 10.20 \$ 10.90 \$ 10.90 \$ 10.90 \$ 10.60*

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE Overtime: See (4, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage - Per hour:

Apprentices: (1) year terms

1st year	07/01/2020	10/01/2020	10/01/2021
	\$ 20.10	\$ 20.60	\$ 21.20
	+ 3.15*	+ 3.45*	+ 3.86*
2nd year	\$ 30.15	\$ 30.90	\$ 31.80
	+ 4.73*	+ 5.18*	+ 5.78*
3rd year	\$ 40.20	\$ 41.20	\$ 42.40
	+ 6.30*	+ 6.90*	+ 7.71*
Supplemental Benefits - Per hour:	0.00	0.00	
1st year	\$.25	\$.25	\$.25
	+ 11.86*	+ 12.00*	+ 12.24*
2nd year	\$ 10.20	\$ 10.90	\$ 10.90
	+ 17.79*	+ 18.00*	+ 18.36*
3rd year	\$ 10.20	\$ 10.90	\$ 10.90
	+ 23.72*	+ 24.00*	+ 24.48*

NOTE: All premium wages are to be calculated on base rate per hour only.

8-DC-9/806/155-BrSS

Painter - Line Striping 09/01/2020

JOB DESCRIPTION Painter - Line Striping

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per hour:

Painter (Striping-Highway):

07/01/2020

07/01/2021

07/01/2022

DISTRICT 8

^{*} For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

Striping-Machine Operator*	\$ 30.10	\$ 30.32	\$ 31.53
Linerman Thermoplastic	\$ 36.53	\$ 36.93	\$ 38.34

Note: * Includes but is not limited to: Positioning of cones and directing of traffic using hand held devices. Excludes the Driver/Operator of equipment used in the maintenance and protection of traffic safety.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day.

NOTE - In order to use the '4 Day/10 Hour Work Schedule,' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SHIPPH	EMENTAL	RENEFITS

Per hour paid:	07/01/2020	07/01/2021	07/01/2022
Journeyworker: Striping Machine Operator: Linerman Thermoplastic:	\$ 9.16 \$ 9.16	\$ 10.03 \$ 10.03	\$ 10.03 \$ 10.03
OVERTIME PAY			

See (B, B2, E2, F, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 20) on HOLIDAY PAGE Overtime: See (5, 20) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rates:

One (1) year terms at the following wage rates:			
	07/01/2020	07/01/2021	07/01/2022
1st Term:	\$ 12.04	\$ 12.12	\$ 12.61
2nd Term:	\$ 18.06	\$ 18.19	\$ 19.82
Ord Transaction	0.04.00	0.4.00	# 05 00
3rd Term:	\$ 24.08	\$ 24.26	\$ 25.22
Supplemental Benefits per hour:			
Cappionian Zonomo por noun			
1st term:	\$ 9.16	\$ 10.03	\$ 10.03
2nd Term:	\$ 9.16	\$ 10.03	\$ 10.03
3rd Term:	\$ 9.16	\$ 10.03	\$ 10.03

8-1456-LS

Painter - Metal Polisher 09/01/2020

JOB DESCRIPTION Painter - Metal Polisher

DISTRICT 8

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

07/01/2020 Metal Polisher \$ 36.33 Metal Polisher* 37.43 Metal Polisher** 40.33

*Note: Applies on New Construction & complete renovation

SUPPLEMENTAL BENEFITS

07/01/2020 Per Hour:

Journeyworker:

All classification \$ 9.94

^{**} Note: Applies when working on scaffolds over 34 feet.

OVERTIME PAY

See (B, E, P, T) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE Overtime: See (5, 6, 9, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year term at the following wage rates:

	07/01/2020
1st year	\$ 16.00
2nd year	17.00
3rd year	18.00
1st year*	\$ 16.39
2nd year*	17.44
3rd year*	18.54
1st year**	\$ 18.50
2nd year**	19.50
3rd year**	20.50

^{*}Note: Applies on New Construction & complete renovation

Supplemental benefits:

Per hour:

 1st year
 \$ 6.69

 2nd year
 6.69

 3rd year
 6.69

8-8A/28A-MP

Plumber 09/01/2020

JOB DESCRIPTION Plumber DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

WAGES

Per hour:

07/01/2020

Plumber and

Steamfitter \$ 57.86

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 37.56

OVERTIME PAY

See (B, E, E2, Q, V) on OVERTIME PAGE OVERTIME:... See on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1)year terms at the following wages:

1st Term \$ 21.44 2nd Term 24.62

^{**} Note: Applies when working on scaffolds over 34 feet.

3rd Term	28.42
4th Term	40.61
5th Term	43.58
0 1 115 5	

Supplemental Benefits per hour:

1st term \$ 15.59 2nd term 17.38 3rd term 20.69 4th term 27.20 5th term 28.82

8-21.1-ST

Plumber - HVAC / Service 09/01/2020

JOB DESCRIPTION Plumber - HVAC / Service

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Delaware: Only the townships of Middletown and Roxbury
Ulster: Entire County(including Wallkill and Shawangunk Prisons) except for remainder of Town of Shawangunk and Towns of Plattekill,

Marlboro, and Wawarsing.

WAGES

07/01/2020 Per hour:

HVAC Service \$ 39.68

+ \$ 4.32*

SUPPLEMENTAL BENEFITS

Per hour:

07/01/2020

Journeyworker HVAC Service

\$ 25.14

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 16, 25) on HOLIDAY PAGE See (5, 6, 16, 25) on HOLIDAY PAGE Overtime:

REGISTERED APPRENTICES

HVAC SERVICE

(1) year terms at the following wages:

07/01/2020

1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
\$ 18.05	\$ 21.33	\$ 26.66	\$ 32.76	\$ 35.46
+\$2.37*	+\$2.67*	+\$3.22*	+\$3.84*	+\$4.07*

^{*}Note: This portion of wage is not subject to overtime premium.

Supplemental Benefits per hour:

Apprentices	07/01/2020
1st term 2nd term 3rd term 4th term 5th term	\$ 19.03 20.09 21.30 22.90 24.07

8-21.1&2-SF/Re/AC

09/01/2020

^{*}Note: This portion of wage is not subject to overtime premium.

DISTRICT 8

JOB DESCRIPTION Plumber - Jobbing & Alterations

ENTIRE COUNTIES

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Ulster: Entire county (including Wallkill and Shawangunk Prisons in Town of Shawangunk) EXCEPT for remainder of Town of Shawangunk, and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour: 07/01/2020 Journeyworker: \$44.91

Repairs, replacements and alteration work is any repair or replacement of a present plumbing system that does not change existing roughing or water supply lines.

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour: Journeyworker

\$31.60

OVERTIME PAY

See (B, *E, E2, Q, V) on OVERTIME PAGE

*When used as a make-up day, hours after 8 on Saturday shall be paid at time and one half.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wages:

1st year	\$ 19.52
2nd year	21.65
3rd year	23.42
4th year	32.92
5th year	34.76

Supplemental Benefits per hour:

1st year	\$ 10.21
2nd year	12.05
3rd year	15.88
4th year	21.42
5th year	23.29

8-21.3-J&A

Roofer 09/01/2020

JOB DESCRIPTION Roofer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, New York, Orange, Putnam, Queens, Richmond, Rockland, Sullivan, Ulster, Westchester

WAGES

Per Hour: 07/01/2020

Roofer/Waterproofer \$ 44.25 + \$7.00*

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

SUPPLEMENTAL BENEFITS

Per Hour: \$ 27.87

OVERTIME PAY

See (B, H) on OVERTIME PAGE

^{*} This portion is not subject to overtime premiums.

Note: An observed holiday that falls on a Sunday will be observed the following Monday.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year term

1st 2nd 3rd 4th \$ 15.49 \$ 22.13 \$ 26.55 \$ 33.19 + 3.00* + 4.20* + 5.26*

Supplements:

1st 2nd 3rd 4th \$ 3.57 \$ 14.10 \$ 16.85 \$ 20.98

9-8R

Sheetmetal Worker 09/01/2020

JOB DESCRIPTION Sheetmetal Worker DISTRICT 8

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

07/01/2020 SheetMetal Worker \$ 43.65 + 3.27*

SHIFT WORK

For all NYS D.O.T. and other Governmental mandated off-shift work: 10% increase for additional shifts for a minimum of five (5) days

SUPPLEMENTAL BENEFITS

Journeyworker \$ 42.55

OVERTIME PAY

OVERTIME:.. See (B, E, Q,) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 16, 23) on HOLIDAY PAGE

REGISTERED APPRENTICES

TSt	∠na	310	4tn	ວເກ	งเก	/tn	ชเก
\$ 16.16	\$ 18.18	\$ 20.21	\$ 22.23	\$ 24.24	\$ 26.27	\$ 28.77	\$ 31.27
+ 1.31*	+ 1.47*	+ 1.64*	+ 1.80*	+ 1.96*	+ 2.13*	+ 2.29*	+ 2.45*

^{*}This portion is not subject to overtime premiums.

Supplemental Benefits per hour:

Apprentices

1st term	\$ 18.31
2nd term	20.60
3rd term	22.88
4th term	25.19
5th term	27.47
6th term	29.75
7th term	31.56
8th term	33.39

8-38

Sheetmetal Worker 09/01/2020

JOB DESCRIPTION Sheetmetal Worker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per Hour: 07/01/2020 8/01/2020

Sign Erector \$ 50.79 \$ 52.29

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^{*}This portion is not subject to overtime premiums.

9th

\$38.77

10th

\$ 41.29 4-137-SE

1-669.2

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2020 8/01/2020

Sign Erector \$ 49.82 \$ 51.26

OVERTIME PAY

See (A, F, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE Overtime: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

4th

REGISTERED APPRENTICES

2nd

Per Hour:

1st

6 month Terms at the following percentage of Sign Erectors wage rate:

3rd

50% 55% 60% 65% 70% 75% 80% 35% 40% 45% SUPPLEMENTAL BENEFITS Per Hour: 07/01/2020 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th \$ 13.96 \$ 15.81 \$ 17.68 \$ 19.56 \$ 27.26 \$ 29.65 \$ 32.80 \$ 35.26 \$ 37.71 \$40.15 8/01/2020 3rd 2nd 4th 5th 6th 7th 8th 9th 10th 1st

6th

7th

\$33.72

8th

\$ 36.27

Sprinkler Fitter 09/01/2020

\$ 30.47

JOB DESCRIPTION Sprinkler Fitter DISTRICT 1

\$ 28.02

\$ 20.10

5th

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

\$ 18.17

WAGES

\$ 14.34

Per hour

07/01/2020

Sprinkler \$45.52

\$ 16.26

Fitter

SUPPLEMENTAL BENEFITS

Per hour

Journeyperson \$ 27.57

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

Note: When a holiday falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double time rate. When a holiday falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double time rate.

REGISTERED APPRENTICES

Wages per hour

One Half Year terms at the following percentage of journeyperson's wage.

1st \$ 21.97	2nd \$ 24.41	3rd \$ 26.59	4th \$ 29.02	5th \$ 31.45	6th \$ 33.88	7th \$ 36.31	8th \$ 38.74	9th \$ 41.17	10th \$ 43.60
Supplemental	Benefits per	hour							
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 8.27	\$ 8.27	\$ 18.70	\$ 18.70	\$ 18.95	\$ 18.95	\$ 18.95	\$ 18.95	\$ 18.95	\$ 18.95

DISTRICT 8

Teamster - Building / Heavy&Highway

09/01/2020

JOB DESCRIPTION Teamster - Building / Heavy&Highway

ENTIRE COUNTIES

Putnam. Westchester

WAGES

GROUP A: Straight Trucks (6-wheeler and 10-wheeler), A-frame, Winch, Dynamite Seeding, Mulching, Agitator, Water, Attenuator, Light Towers, Cement (all types), Suburban, Station Wagons, Cars, Pick Ups, any vehicle carrying materials of any kind.

GROUP AA: Tack Coat

GROUP B: Tractor & Trailers (all types).

GROUP BB: Tri-Axle,14 Wheeler

GROUP C: Low Boy (carrying equipment).

GROUP D: Fuel Trucks, Tire Trucks.

GROUP E: Off-road Equipment (over 40 tons): Athey Wagons, Belly Dumps, Articulated Dumps, Trailer Wagons.

GROUP F: Off-road Equipment (over 40 tons) Euclid, DJB.

GROUP G: Off-road Equipment (under 40 tons) Athey Wagons, Belly Articulated Dumps, Trailer Wagons.

GROUP H: Off-road Equipment(under 40 tons), Euclid.

GROUP HH: Off-road Equipment(under 40 tons) D.J.B.

07/01/2020

GROUP I: Off-road Equipment(under 40 tons) Darts.

GROUP II: Off-road Equipment(under 40 tons) RXS.

WAGES:(per hour)

	0.70.72020
GROUP A	\$ 42.47*
GROUP AA	45.27*
GROUP B	43.09*
GROUP BB	42.59*
GROUP C	45.22*
GROUP D	42.92*
GROUP E	43.47*
GROUP F	44.47*
GROUP G	43.22*
GROUP H	43.84*
GROUP HH	44.22*
GROUP I	43.97*
GROUP II	44.34*

^{*} To calculate premium wage, subtract \$.20 from the hourly wage.

Note: Fuel truck operators on construction sites addit. \$5.00 per day.

For work on hazardous/toxic waste site addit. 20% of hourly rate.

Shift Differential:NYS DOT or other Governmental Agency contracts shall receive a shift differential of Fifteen(15%)percent above the wage rate

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker

First 40 hours \$ 33.64 41st-45th hours 15.18 Over 45 hours 0.26

OVERTIME PAY

See (B, E, P, R) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE Overtime: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

8-456

Welder 09/01/2020

JOB DESCRIPTION Welder

DISTRICT 1

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour 07/01/2020

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

(AA)	Time and one half of the hourly rate after 7 and one half hours per day
(A)	Time and one half of the hourly rate after 7 hours per day
(B)	Time and one half of the hourly rate after 8 hours per day
(B1)	Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday. Double the hourly rate for all additional hours
(B2)	Time and one half of the hourly rate after 40 hours per week
(C)	Double the hourly rate after 7 hours per day
(C1)	Double the hourly rate after 7 and one half hours per day
(D)	Double the hourly rate after 8 hours per day
(D1)	Double the hourly rate after 9 hours per day
(E)	Time and one half of the hourly rate on Saturday
(E1)	Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
(E2)	Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
(E3)	Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
(E4)	Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
(E5)	Double time after 8 hours on Saturdays
(F)	Time and one half of the hourly rate on Saturday and Sunday
(G)	Time and one half of the hourly rate on Saturday and Holidays
(H)	Time and one half of the hourly rate on Saturday, Sunday, and Holidays
(1)	Time and one half of the hourly rate on Sunday
(J)	Time and one half of the hourly rate on Sunday and Holidays
(K)	Time and one half of the hourly rate on Holidays
(L)	Double the hourly rate on Saturday
(M)	Double the hourly rate on Saturday and Sunday
(N)	Double the hourly rate on Saturday and Holidays
(O)	Double the hourly rate on Saturday, Sunday, and Holidays
(P)	Double the hourly rate on Sunday
(Q)	Double the hourly rate on Sunday and Holidays
(R)	Double the hourly rate on Holidays
(S)	Two and one half times the hourly rate for Holidays

- (S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.
- (T) Triple the hourly rate for Holidays
- (U) Four times the hourly rate for Holidays
- (V) Including benefits at SAME PREMIUM as shown for overtime
- (W) Time and one half for benefits on all overtime hours.
- (X) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

(1)	None
(2)	Labor Day
(3)	Memorial Day and Labor Day
(4)	Memorial Day and July 4th
(5)	Memorial Day, July 4th, and Labor Day
(6)	New Year's, Thanksgiving, and Christmas
(7)	Lincoln's Birthday, Washington's Birthday, and Veterans Day
(8)	Good Friday
(9)	Lincoln's Birthday
(10)	Washington's Birthday
(11)	Columbus Day
(12)	Election Day
(13)	Presidential Election Day
(14)	1/2 Day on Presidential Election Day
(15)	Veterans Day
(16)	Day after Thanksgiving
(17)	July 4th
(18)	1/2 Day before Christmas
(19)	1/2 Day before New Years
(20)	Thanksgiving
(21)	New Year's Day
(22)	Christmas
(23)	Day before Christmas
(24)	Day before New Year's
(25)	Presidents' Day
(26)	Martin Luther King, Jr. Day
(27)	Memorial Day
(28)	Easter Sunday



New York State Department of Labor - Bureau of Public Work State Office Building Campus Building 12 - Room 130 Albany, New York 12240

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

 $Fax\ (518)\ 485\text{-}1870\ \text{or mail this form for new schedules or for determination for additional occupations}.$

This Form Must Be Typed

Submitted By: (Check Only One) Contracting Agency Architect or Engineering	g Firm Public Work District Office Date	2:
A. Public Work Contract to be let by: (Enter Data Pertaining to	Contracting/Public Agency)	
1. Name and complete address	Construction Fund	□ 07 City □ 08 Local School District □ 09 Special Local District, i.e., Fire, Sewer, Water District □ 10 Village □ 11 Town □ 12 County □ 13 Other Non-N.Y. State (Describe)
E-Mail: 3. SEND REPLY TO Check if new or change) Name and complete address:	4. SERVICE REQUIRED. Check appropriate information. New Schedule of Wages and Supplem APPROXIMATE BID DATE: Additional Occupation and/or Redetern	pox and provide project nents.
Telephone:() Fax: () E-Mail:	PRC NUMBER ISSUED PREVIOUSLY FOR THIS PROJECT:	OFFICE USE ONLY
B. PROJECT PARTICULARS		
5. Project Title Description of Work Contract Identification Number Note: For NYS units, the OSC Contract No.	6. Location of Project: Location on Site Route No/Street Address Village or City Town County	
7. Nature of Project - Check One: 1. New Building 2. Addition to Existing Structure 3. Heavy and Highway Construction (New and Repair) 4. New Sewer or Waterline 5. Other New Construction (Explain) 6. Other Reconstruction, Maintenance, Repair or Alteration 7. Demolition 8. Building Service Contract	8. OCCUPATION FOR PROJECT : Construction (Building, Heavy Highway/Sewer/Water) Tunnel Residential Landscape Maintenance Elevator maintenance Exterminators, Fumigators Fire Safety Director, NYC Only	☐ Guards, Watchmen ☐ Janitors, Porters, Cleaners, Elevator Operators ☐ Moving furniture and equipment ☐ Trash and refuse removal ☐ Window cleaners ☐ Other (Describe)
9. Has this project been reviewed for compliance with the Wi	cks Law involving separate bidding?	YES NO
10. Name and Title of Requester	Signature	

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	NYC	****9839	A.J.S. PROJECT MANAGEMENT, INC.		149 FIFTH AVENUE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL	****3344	ACT INC		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	****4018	ADIRONDACK BUILDING RESTORATION INC.		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	AG	****1812	ADVANCED BUILDERS & LAND DEVELOPMENT, INC.		400 OSER AVE #2300HAUPPAUGE NY 11788	09/11/2019	09/11/2024
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	07/29/2015	07/29/2020
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	NYC	****6775	ADVENTURE MASONRY CORP.		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC		AGOSTINHO TOME		405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	DOL		AJ TORCHIA		10153 ROBERTS RD SAUQUOIT NY 13456	08/09/2016	08/09/2021
DOL	DOL	****3344	ALL CATASTROPHE CONSTRUCTION TEAM INC	ACT INC	6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL		AMADEO J TORCHIA	TORCHIA'S HOME IMPROVEMEN T	10153 ROBERTS RD SAUQUOIT NY 13456	08/09/2016	08/09/2021
DOL	NYC		AMJAD NAZIR		2366 61ST ST BROOKLYN NY 11204	12/15/2016	12/15/2021
DOL	DOL		ANGELO F COKER			12/04/2018	12/04/2023
DOL	NYC		ANISUL ISLAM		C/O RELIANCE GENERAL CONS 644 OCEAN PARKWAYBROOKLYN NY 11230	09/02/2015	09/02/2020
DOL	DOL		ANITA SALERNO		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	NYC		ANTHONY J SCLAFANI		149 FIFTH AVE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL		ANTHONY PERGOLA		3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10323	01/23/2017	01/23/2022
DOL	DOL		ANTONIO ESTIVEZ		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3020	APCO CONTRACTING CORP		24 SOUTH MARYLAND AVENUE PORT WASHINGTON NY 11050	09/24/2012	09/02/2020
DOL	DOL		ARNOLD A. PAOLINI		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC		ARSHAD MEHMOOD		168-42 88TH AVENUE JAMAICA NY 11432	11/20/2019	11/20/2024
DOL	DOL		ARVINDER ATWAL		65 KENNETH PLACE NEW HYDE PARK NY 11040	07/19/2017	07/19/2022
DOL	NYC	****4779	ASTORIA GENERAL CONTRACTING CORP		35-34 31ST STREET LONG ISLAND CITY NY 11106	09/02/2015	09/02/2020
DOL	NYC	****7217	ASTRO COMMUNICATIONS OF NY CORP		79 ALEXANDER AVE- STE 36A BRONX NY 10454	10/30/2015	10/30/2020
DOL	NYC	****6683	ATLAS RESTORATION CORP.		35-12 19TH AVENUE ASTORIA NY 11105	08/02/2017	08/02/2022
DOL	NYC	****5532	ATWAL MECHANICALS, INC		65 KENNETH PLACE NEW HYDE PARK NY 11040	07/19/2017	07/19/2022
DOL	NYC	****2591	AVI 212 INC.		260 CROPSEY AVENUE APT 11GBROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	AG		AVTAR SINGH		116-24 127TH STREET SOUTH OZONE PARK NY 11420	12/22/2015	12/22/2020
DOL	AG		BALDEV SINGH		116-24 127TH STREET SOUTH OZONE PARK NY 11420	12/22/2015	12/22/2020
DOL	NYC		BALWINDER SINGH		421 HUDSON ST SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	DOL		BARRY KINNEY		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020

DOL	NYC	****3915	BEACON RESTORATION INC		SUITE B-8 782 PELHAM PARKWAY SOUTHBRONX NY 10462	04/21/2016	04/21/2021
DOL	NYC	****8416	BEAM CONSTRUCTION, INC.		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	DOL		BIAGIO CANTISANI			06/12/2018	06/12/2023
DOL	DOL	****4512	BOB BRUNO EXCAVATING,		5 MORNINGSIDE DR AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		BOGDAN MARKOVSKI		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL	*****8551	BRANDY'S MASONRY		216 WESTBROOK STREET P O BOX 304SAYRE PA 18840	08/09/2016	08/09/2021
DOL	DOL	****1449	BRRESTORATION NY INC		140 ARCADIA AVENUE OSWEGO NY 13126	09/12/2016	09/12/2021
DOL	DOL		BRUCE MORSEY		C/O KENT HOLLOW SIDING LL 29A BRIDGE STREETNEW MILFORD CT 06776	01/15/2016	01/15/2021
DOL	DOL		BRUCE P. NASH JR.		5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL	*****0225	C&D LAFACE CONSTRUCTION, INC.		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	****8809	C.B.E. CONTRACTING CORPORATION		310 MCGUINESS BLVD GREENPOINT NY 11222	03/07/2017	03/07/2022
DOL	DOL	****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		CANTISANI & ASSOCIATES LTD		442 ARMONK RD MOUNT KISCSO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CANTISANI HOLDING LLC			06/12/2018	06/12/2023
DOL	DOL		CARIBBEAN POOLS		C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVEBINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL		CARMEN RACHETTA		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	02/03/2025
DOL	DOL		CARMENA RACHETTA		8531 OSWEGO ROAD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****3812	CARMODY "2" INC			06/12/2018	06/12/2023
DOL	DOL	*****1143	CARMODY BUILDING CORP	CARMODY CONTRACTIN G AND CARMODY CONTRACTIN G CORP.	442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY CONCRETE CORPORATION			06/12/2018	06/12/2023
DOL	DOL		CARMODY ENTERPRISES, LTD.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY INC		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3812	CARMODY INDUSTRIES INC			06/12/2018	06/12/2023
DOL	DOL		CARMODY MAINTENANCE CORPORATION		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY MASONRY CORP		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	****8809	CBE CONTRACTING CORP		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	AG		CESAR J. AGUDELO		81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	DOL	****7655	CHAMPION CONSTRUCTION SERVICES CORP		2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL		CHARLES ZIMMER JR		216 WESTBROOK STREET P O BOX 304SAYRE PA 18840	08/09/2016	08/09/2021
DOL	DOL		CHRISTINE J HEARNE		C/O CJ-HEARNE CONSTRUCTIO 131 PONCE DE LEON AVE	12/01/2015	12/01/2020
					NEATLANTA GA 30308	li i	l .

DOL	DOL		CHRISTOPHER		1445 COMMERCE AVE	05/30/2019	05/30/2024
			PAPASTEFANOU A/K/A CHRIS PAPASTEFANOU		BRONX NY 10461		
DOL	DOL	*****0671	CJ-HEARNE CONSTRUCTION CO		SUITE 204 131 PONCE DE LEON AVENUEATLANTA GA 30308	12/01/2015	12/01/2020
DOL	DOL	****1927	CONSTRUCTION PARTS WAREHOUSE, INC.	CPW	5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	NYC	****2164	CREATIVE TRUCKING INC		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	DOL	****2524	CSI ELECTRICAL & MECHANICAL INC		42-32 235TH ST DOUGLASTON NY 11363	01/14/2019	01/14/2024
DOL	DOL	****7761	D L MALARKEY CONSTRUCTION		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	****7888	D L MALARKEY CONSTRUCTION INC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	****5629	DAKA PLUMBING AND HEATING LLC		2561 ROUTE 55 POUGHQUAG NY 12570	02/19/2016	02/19/2021
DOL	NYC		DALJIT KAUR BOPARAI		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	DOL		DANICA IVANOSKI		61 WILLETT ST. PASSAIC NJ 07503	10/26/2016	10/26/2021
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL		DAVID MARTINEZ		C/O EMPIRE TILE INC 6 TREMONT COURTHUNTINGTON STATION NY 11746	03/08/2016	03/08/2021
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL		DEBBIE STURDEVANT		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	AG		DEBRA MARTINEZ		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		DEDA GAZIVODAN		C/O DAKA PLUMBING AND H 2561 ROUTE 55POUGHQUAG NY 12570	02/19/2016	02/19/2021
DOL	DOL		DELPHI PAINTING & DECORATING CO INC		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		DENNIS SCHWANDTNER		C/O YES SERVICE AND REPAI 145 LODGE AVEHUNTINGTON STATION NY 11476	08/09/2016	08/09/2021
DOL	DOL		DF CONTRACTORS OF ROCHESTER, INC.		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DF CONTRACTORS, INC.		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	NYC		DIMITRIOS KOUTSOUKOS		C/O ASTORIA GENERAL CONTR 35-34 31ST STREETLONG ISLAND CITY NY 11106	09/02/2015	09/02/2020
DOL	NYC		DIMITRIOS TSOUMAS		35-12 19TH AVENUE ASTORIA NY 11105	08/02/2017	08/02/2022
DOL	DOL		DOMENICO LAFACE		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	****3242	DONALD R. FORSAY	DF LAWN SERVICE	1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DONALD R. FORSAY		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DORIS SKODA		C/O APCO CONTRACTING CORP 24 SOUTH MARYLAND AVENUEPORT WASHINGTON NY 11050	09/24/2012	09/02/2020
DOL	NYC	****7404	DOSANJH CONSTRUCTION CORP		9439 212TH STREET QUEENS VILLAGE NY 11428	02/25/2016	02/25/2021
DOL	DOL		DOUGLAS L MALARKEY	MALARKEY CONSTRUCTI ON	64 VICTORIA DRIVE B INGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	NYC		DUARTE LOPES		66-05 WOODHAVEN BLVD. STE 2REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	DOL		E C WEBB		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025

DOL	DOL		EARL L WILSON	WILSON BROTHER DRYWALL CONTRACTOR S	36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL		EAST COAST PAVING		2238 BAKER RD GILLETT PA 16923	03/12/2018	03/12/2023
DOL	NYC	****4269	EAST PORT EXCAVATION & UTILITIES		601 PORTION RD RONKONKOMA NY 11779	11/18/2016	11/18/2021
DOL	DOL	*****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	DOL	****3270	EMPIRE TILE INC		6 TREMONT COURT HUNTINGTON STATION NY 11746	03/08/2016	03/08/2021
DOL	NYC	****5917	EPOCH ELECTRICAL, INC		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2024
DOL	DOL	****7403	F & B PAINTING CONTRACTING INC		2 PARKVIEW AVENUE HARRISON NY 10604	09/26/2016	09/26/2021
DOL	DOL		FAIGY LOWINGER		11 MOUNTAIN RD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL		FAY MATTHEW		C/O CHAMPION CONSTRUCTION 2131 SCHENECTADY AVENUEBROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL		FAZIA GINA ALI-MOHAMMED	C/O CHAMPION CONSTRUCTI ON	2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL		FRANK BENEDETTO		19 CATLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL		FRANK BENEDETTO		C/O F & B PAINTING CONTRA 2 PARKVIEW AVENUEHARRISON NY 10604	09/26/2016	09/26/2021
DOL	DOL	****4722	FRANK BENEDETTO AND CHRISTOPHER J MAINI	B & M CONCRETE	19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	NYC		FRANK MAINI		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	NYC	*****6616	G & G MECHANICAL ENTERPRISES, LLC.		1936 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		GABRIEL FRASSETTI			04/10/2019	04/10/2024
DOL	DOL		GALINDA ROTENBERG		C/O GMDV TRANS INC 67-48 182ND STREETFRESH MEADOWS NY 11365	06/24/2016	06/24/2021
DOL	DOL		GEOFF CORLETT		415 FLAGGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DA		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DOL		GIGI SCHNECKENBURGER		261 MILL RD EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		GIOVANNI LAFACE		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	NYC	****3164	GLOBE GATES INC	GLOBAL OVERHEAD DOORS	405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	DOL	****5674	GMDV TRANS INC		67-48 182ND STREET FRESH MEADOWS NY 11365	06/24/2016	06/24/2021
DOL	NYC		GREAT ESTATE CONSTRUCTION, INC.		327 STAGG ST BROOKLYN NY 11206	10/10/2017	10/10/2022
DOL	DOL		GREGORY S. OLSON		P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC		HARMEL SINGH		15 CLINTON LANE HICKSVILLE NY 11801	02/25/2016	02/25/2021
DOL	NYC		HAROLD KUEMMEL		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	NYC	****3228	HEIGHTS ELEVATOR CORP.		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	DOL		HENRY VAN DALRYMPLE		2663 LANTERN LANE ATLANTA GA 30349	12/01/2015	12/01/2020
DOL	DOL	****8282	IDEMA DEVELOPMENT INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020

DOL	DOL	****8282	IDEMA GENERAL CONTRACTORS INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL	****7001	INTEGRATED CONSTRUCTION & POWER SYSTEMS INC		SUITE 100 2105 W GENESEE STREETSYRACUSE NY 13219	01/06/2016	01/06/2021
DOL	DOL	****5131	INTEGRITY MASONRY, INC.	M&R CONCRETE	722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		IRENE KASELIS		32 PENNINGTON AVE WALDWICK NJ 07463	05/30/2019	05/30/2024
DOL	AG		J A M CONSTRUCTION CORP		SUITE 125 265 SUNRISE HIGHWAYROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	DOL		J.A. HIRES CADWALLADER		P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JAMES B RHYNDERS		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		JAMES C. DELGIACCO		722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		JAMES E RHYNDERS		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	AG		JAMES FALCONE		SUITE 125 265 SUNRISE HIGHWAYROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	DOL		JAMES LIACONE		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JAMES RACHEL		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JAMES RHYNDERS SR		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		JASON W MILLIMAN		C/O ROCHESTER ACOUSTICAL P O BOX 799HILTON NY 14468	02/19/2016	02/19/2021
DOL	DOL	****5368	JCH MASONRY & LANDSCAPING INC.		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	NYC		JENNIFER GUERRERO		1936 HEMPSTEAD TURNPIKE EAST MEADOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		JESSICA WHITESIDE		C/O BRRESTORATION NY INC 140 ARCADIA AVENUEOSWEGO NY 13126	09/12/2016	09/12/2021
DOL	AG		JOHN ANTHONY MASSINO		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JOHN F. CADWALLADER		200 LATTA BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	****4612	JOHN F. CADWALLADER, INC.	THE GLASS COMPANY	P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	AG	****0600	JOHNCO CONTRACTING, INC.		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296EAST AURORA NY 14052	07/29/2015	07/29/2020
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		JORI PEDERSEN		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		JOSE CHUCHUCA		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	AG		JOSEPH FALCONE		SUITE 125 265 SUNRISE HIGHWAYROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	NYC		JOSEPH FOLEY		66-05 WOODHAVEN BLVD. STE 2REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	DOL	****9273	JOSEPH M LOVETRO		P O BOX 812 BUFFALO NY 14220	08/09/2016	08/09/2021
DOL	NYC		JOSEPH MARTINO		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	DOL		JOY MARTIN		2404 DELAWARE AVE NIGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		JULIUS AND GITA BEHREND		5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002

DOL	DOL	****5062	K R F SITE DEVELOPMENT INC		375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579	01/23/2017	01/23/2022
DOL	NYC		K.S. CONTRACTING CORP.		29 PHILLIP DRIVE PARSIPPANY NJ 07054	02/13/2017	02/13/2022
DOL	DOL		KATIE BURDICK		2238 BAKER RD GILLETT PA 16923	03/12/2018	03/12/2023
DOL	DOL		KENNETH FIORENTINO		375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579	01/23/2017	01/23/2022
DOL	DOL	****9732	KENT HOLLOW SIDING LLC		29A BRIDGE STREET NEW MILFORD CT 06776	01/15/2016	01/15/2021
DOL	DOL		KIM SOROCENSKI		C/O SOLUTION MATTERS INC 198 NORWOOD ROADPORT JEFFERSON NY 11776	11/19/2015	11/19/2020
DOL	DOL	****3490	L & M CONSTRUCTION/DRYWALL INC.		1079 YONKERS AVE YONKERS NY 10704	08/07/2018	08/07/2023
DOL	DA	*****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	AG	****4643	LALO DRYWALL, INC.		221 OLD FORD ROAD NEW PLATZ NY 12561	05/20/2016	05/20/2021
DOL	DOL	****4505	LARAPINTA ASSOCIATES INC		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	DOL		LAVERN GLAVE		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	06/24/2016	09/19/2022
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	06/24/2016	09/19/2022
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	01/17/2017	09/19/2022
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	08/14/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	08/14/2017	08/14/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	01/17/2017	09/19/2022
DOL	DA	****4460	LONG ISLAND GLASS & STOREFRONTS, LLC		4 MANHASSET TRL RIDGE NY 11961	09/06/2018	09/06/2023
DOL	AG	****4216	LOTUS-C CORP.		81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	NYC		LUBOMIR PETER SVOBODA		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	AG		LUIS MARTINEZ	LALO DRYWALL	211 MAIN ST. NEW PALTZ NY 12561	05/20/2016	05/20/2021
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL		M ANVER BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	AG	****6957	M B DIN CONSTRUCTION INC		8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214	11/17/2015	11/17/2020
DOL	DOL		M. ANVER BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	NYC	****9590	MACK GLASSNAUTH IRON WORKS INC		137 LIBERTY AVENUE BROOKLYN NY 11212	12/21/2015	12/21/2020
DOL	DOL	****1784	MADISON AVE CONSTRUCTION CORP		39 PENNY STREET WEST ISLIP NY 11795	11/02/2016	11/02/2021

DOL	DOL		MALARKEY'S BAR & GRILL LLC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****0705	MALARKEY'S PUB & GRUB LLC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DA		MANUEL P TOBIO		150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	DA		MANUEL TOBIO		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	NYC		MAREK FABIJANOWSKI		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	DOL		MARIACHI'S PIZZERIA		C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVEBINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL		MARK MIONIS		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	NYC		MARTINE ALTER		1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	DOL		MARVIN A STURDEVANT		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	DOL		MASONRY CONSTRUCTION, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3333	MASONRY INDUSTRIES, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	NYC		MATINA KARAGIANNIS		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2023
DOL	DOL		MATTHEW IDEMA GENERAL CONTRACTORS INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		MATTHEW P. KILGORE		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	DOL		MAURICE GAWENO		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	****6416	MCCALL MASONRY		P O BOX 304 SAYRE PA 18840	08/09/2016	08/09/2021
DOL	DOL		MCLEAN "MIKKI BEANE"		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		MCLEAN "MIKKI" DRAKE		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		MCLEAN M DRAKE-BEANE		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL	*****9445	MCLEAN M WALSH	ELITE PROFESSION AL PAINTING OF CNY	1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL	*****9445	MCLEAN M WALSH	ELITE PROFESSION AL PAINTING OF CNY	1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	NYC	****5330	METRO DUCT SYSTEMS INC		1219 ASTORIA BOULEVARD LONG ISLAND CITY NY 11102	04/16/2014	11/19/2020
DOL	DOL		MICHAEL A PASCARELLA		SUITE 100 2105 WEST GENESEE STREET SYRACUSE NY 13219	01/06/2016	01/06/2021
DOL	NYC		MICHAEL HIRSCH		C/O MZM CORP 163 S MAIN STREETNEW CITY NY 10956	01/28/2016	01/28/2021
DOL	DOL		MICHAEL LENIHAN		1079 YONKERS AVE UNIT 4YONKERS NY 10704	08/07/2018	08/07/2023
DOL	AG		MICHAEL RIGLIETTI		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		MICHAEL WILSON	WILSON BROTHER DRYWALL CONTRACTOR S	36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL	****4829	MILESTONE ENVIRONMENTAL CORPORATION	J	704 GINESI DRIVE SUITE 29MORGANVILLE NJ 07751	04/10/2019	04/10/2024
DOL	NYC	****9926	MILLENNIUM FIRE PROTECTION, LLC		325 W. 38TH STREET SUITE 204NEW YORK NY 10018	11/14/2019	11/14/2024
DOL	NYC	****0627	MILLENNIUM FIRE SERVICES, LLC		14 NEW DROP LNE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	AG		MOHAMMED N CHATHA		8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214	11/17/2015	11/17/2020
DOL	DOL	****2737	MOUNTAIN'S AIR INC		2471 OCEAN AVENUE- STE 7A BROOKLYN NY 11229	09/24/2012	09/18/2020

DOL	NYC	****3826	MOVING MAVEN OF NY, INC.	1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	NYC	*****3550	MOVING MAVEN, INC	1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	AG		MSR ELECTRICAL CONSTRUCTION CORP.	31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		MUHAMMAD BEIG	142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	DOL		MUHAMMAD BEIG	142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	DOL		MUHAMMAD PERVAIZ	C/O CHAMPION CONSTRUCTION 2131 SCHENECTADY AVENUEBROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	NYC	*****3613	MZM CORP	163 S MAIN STREET NEW CITY NY 10956	01/28/2016	01/28/2021
DOL	DA	****9786	NATIONAL INSULATION & GC CORP	180 MILLER PLACE HICKSVILLE NY 11801	12/12/2018	12/12/2023
DOL	NYC	****4839	NEW YORK RIGGING CORP	58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	NYC		NICHOLAS FILIPAKIS	7113 FORT HAMILTON PARKWA BROOKLYN NY 11228	12/09/2016	12/09/2021
DOL	DOL	****6966	NORTH COUNTRY DRYWALL AND PAINT	23167 COUNTY ROUTE 59 DEXTER NY 13634	10/24/2016	10/24/2021
DOL	DOL	*****0065	NORTHEAST LANDSCAPE AND MASONRY ASSOC	3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523	01/23/2017	01/23/2022
DOL	DOL	****1845	OC ERECTERS, LLC A/K/A OC ERECTERS OF NY INC.	1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	NYC	*****0818	ONE TEN RESTORATION, INC.	2366 61ST ST BROOKLYN NY 11204	12/15/2016	12/15/2021
DOL	NYC		ORSON ARROYO	C/O METRO DUCT SYSTEMS 12-19 ASTORIA BOULEVARDLONG ISLAND CITY NY 11102	04/16/2014	11/19/2020
DOL	NYC		PARESH SHAH	29 PHILLIP DRIVE PARSIPPANY NJ 07054	02/13/2017	02/13/2022
DOL	NYC	****9422	PELIUM CONSTRUCTION, INC.	22-33 35TH ST. ASTORIA NY 11105	12/30/2016	12/30/2021
DOL	DOL		PETER M PERGOLA	3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523	01/23/2017	01/23/2022
DOL	DOL		PIERRE LAPORT	224 COUNTY HIGHWAY 138 BROADALBIN NY 12025	03/07/2017	03/07/2022
DOL	DOL	****1543	PJ LAPORT FLOORING INC	224 COUNTY HIGHWAY 138 BROADALBIN NY 12025	03/07/2017	03/07/2022
DOL	NYC	****5771	PMJ ELECTRICAL CORP	7113 FORT HAMILTON PARKWA BROOKLYN NY 11228	12/09/2016	12/09/2021
DOL	DOL	****0466	PRECISION BUILT FENCES, INC.	1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC	****4532	PROFESSIONAL PAVERS CORP.	66-05 WOODHAVEN BLVD. REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	DA	*****6817	QUADRANT METAL BUILDINGS LLC	2740 SW MARTIN DOWNS BLVD PALM CITY FL 34990	08/25/2016	08/25/2021
DOL	NYC		RAMESHWAR ASU	137 LIBERTY AVENUE BROOKLYN NY 11212	12/21/2015	12/21/2020
DOL	DOL	****1068	RATH MECHANICAL CONTRACTORS, INC.	24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL	****2633	RAW POWER ELECTRIC CORP	3 PARK CIRCLE MIDDLETOWN NY 10940	01/30/2018	01/30/2023
DOL	AG	*****7015	RCM PAINTING INC.	69-06 GRAND AVENUE 2ND FLOORMASPETH NY 11378	02/07/2018	02/07/2023
DOL	DOL		REGINALD WARREN	161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	NYC	****3461	RELIANCE GENERAL CONSTRUCTION INC	644 OCEAN PARKWAY BROOKLYN NY 11230	09/02/2015	09/02/2020
DOL	DA		RIANN MULLER	2740 SW MARTIN DOWNS BLVD	08/25/2016	08/25/2021
DOL	DOL	****9148	RICH T CONSTRUCTION	PALM CITY FL 34990 107 WILLOW WOOD LANE	11/13/2018	11/13/2023
DOL	DOL	+	RICHARD MACONE	CAMILLUS NY 13031 8617 THIRD AVE	09/17/2018	09/17/2023

DOL	DOL		RICHARD REGGIO		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	DOL	****9148	RICHARD TIMIAN	RICH T CONSTRUCTI ON	108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	11/13/2018	11/13/2023
DOL	DOL		ROBBYE BISSESAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003
DOL	DOL		ROBERT A. VALERINO		3841 LANYARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		ROBERT BRUNO		3 GAYLORD ST AUBURN NY 13021	11/15/2016	11/15/2021
DOL	DOL		ROBERT BRUNO		5 MORNINGSIDE DRIVE AUBURN NY 13021	05/28/2019	05/28/2024
DOL	NYC		ROBERT HOHMAN		149 FIFTH AVE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL	*****3859	ROCHESTER ACOUSTICAL CORP		P O BOX 799 HILTON NY 14468	02/19/2016	02/19/2021
DOL	DOL		RODERICK PUGH		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL	****4880	RODERICK PUGH CONSTRUCTION INC.		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	NYC		RODNEY SCOTT		201 HEMPSTEAD AVE WEST HEMPSTEAD NY 11552	10/30/2015	10/30/2020
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		ROSEANNE CANTISANI			06/12/2018	06/12/2023
DOL	DOL		RYAN ALBIE		21 S HOWELLS POINT ROAD BELLPORT NY 11713	02/21/2017	02/21/2022
DOL	DOL	****3347	RYAN ALBIE CONTRACTING INC		21 S HOWELLS POINT ROAD BELLPORT NY 11713	02/21/2017	02/21/2022
DOL	DOL	****1365	S & L PAINTING, INC.		11 MOUNTAIN ROAD P.O BOX 408MONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	****7730	S C MARTIN GROUP INC.		2404 DELAWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	NYC		SABIR MUHAMMED		SUITE B-8 782 PELHAM PARKWAY SOUTHBRONX NY 10462	04/21/2016	04/21/2021
DOL	DOL		SALVATORE A FRESINA			08/26/2016	08/26/2021
DOL	DOL		SAM FRESINA			08/26/2016	08/26/2021
DOL	NYC	****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC		SANDEEP BOPARAI		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	NYC	****2117	SCOTT ELECTRICAL SERVICE, LLC.		201 HEMPSTEAD AVE WEST HEMPSTEAD NY 11552	10/30/2015	10/30/2020
DOL	DOL	*****9751	SCW CONSTRUCTION		544 OLD ROUTE 23 ACRE NY 12405	02/14/2017	02/14/2022
DOL	AG		SERGIO RAYMUNDO		109 DUBOIS RD. NEW PALTZ NY 12561	05/20/2016	05/20/2021
DOL	NYC	****6597	SHAIRA CONSTRUCTION CORP.		421 HUDSON STREET SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	DOL	****1961	SHANE BURDICK	CENTRAL TRAFFIC CONTROL, LLC.	2238 BAKER ROAD GILLETT PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE BURDICK	LLO.	2238 BAKER ROAD GILLETT PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE NOLAN		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		SHULEM LOWINGER		11 MOUNTAIN ROAD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	****0816	SOLAR ARRAY SOLUTIONS,		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023

DOL	DOL	****4025	SOLUTION MATTERS INC		198 NORWOOD ROAD PORT JEFFERSON NY 11776	11/19/2015	11/19/2020
DOL	DOL	****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	DOL	*****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL	****6844	STEAM PLANT AND CHX SYSTEMS INC.		14B COMMERCIAL AVENUE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	****9933	STEED GENERAL CONTRACTORS, INC.		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		STEFANOS PAPASTEFANOU, JR. A/K/A STEVE PAPASTEFANOU, JR.		256 WEST SADDLE RIVER RD UPPER SADDLE RIVER NJ 07458	05/30/2019	05/30/2024
DOL	DOL	*****9751	STEPHEN C WAGAR		544 OLD ROUTE 23 ACRE NY 12405	02/14/2017	02/14/2022
DOL	DOL		STEVE TATE		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	NYC		STEVEN GOVERNALE		601 PORTION RD RONKONKOMA NY 11779	11/18/2016	11/18/2021
DOL	DOL		STEVEN MARTIN		2404 DELWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		STEVEN P SUCATO		15-68 208TH STREET BAYSIDE NY 11360	06/23/2016	06/23/2021
DOL	DOL		STEVEN TESTA		50 SALEM STREET - BLDG B LYNNFIELD MA 01940	01/23/2017	01/23/2022
DOL	NYC	****9432	SUBLINK LTD		346 THIRD AVENUE PELHAM NY 10803	11/19/2015	11/19/2020
DOL	NYC	****5863	SUKHMANY CONSTRUCTION, INC.		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	DOL	****1060	SUNN ENTERPRISES GROUP, LLC		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL	****8209	SYRACUSE SCALES, INC.		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL		TALAILA OCAMPA		1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	DOL	****9852	TAP STEEL INC		ROUTE 26 3101 P O BOX 457CONSTABLEVILLE NY 13325	01/28/2016	01/28/2021
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL		TEST		P.O BOX 123 ALBANY NY 12204	05/20/2020	05/20/2025
DOL	DOL	****5570	TESTA CORP		50 SALEM STREET - BLDG B LYNNFIELD MA 01940	01/23/2017	01/23/2022
DOL	DOL	****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	****8174	THE DALRYMPLE CORPORATION		UNIT 278 541 10TH STREET NWATLANTA GA 30318	12/01/2015	12/01/2020
DOL	DOL	****8174	THE DALRYMPLE GROUP LLC		289 JONESBORO RD/ STE 216 MCDONOUGH GA 30253	12/01/2015	12/01/2020
DOL	DOL		TIMOTHY A PALUCK		C/O TAP STEEL INC RTE 26 3101/ P O BOX 457CONSTABLEVILLE NY 13325	01/28/2016	01/28/2021
DOL	DOL	*****3453	TORCHIA'S HOME IMPROVEMENT		10153 ROBERTS RD SAUQUOIT NY 13456	08/09/2016	08/09/2021
DOL	DOL	*****8311	TRIPLE B FABRICATING, INC.		61 WILLETT ST. PASSAIC NJ 07503	10/26/2016	10/26/2021
DOL	DOL	****9407	TURBO GROUP INC		15-68 208TH STREET BAYSIDE NY 11360	06/23/2016	06/23/2021
DOL	DOL	****6392	V.M.K CORP.		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	NYC		VALERIE VISCONTI		346 THIRD AVENUE PELHAM NY 10803	11/19/2015	11/19/2020
DOL	NYC	****7361	VIABLE HOLDINGS, INC.	MOVING MAVEN	1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	DOL		VICTOR ALICANTI		42-32 235TH ST DOUGLASTON NY 11363	01/14/2019	01/14/2024
DOL	DOL		VICTOR ROTENBERG		C/O GMDV TRANS INC 67048 182ND STREETFRESH MEADOWS NY 11365	06/24/2016	06/24/2021
DOL	NYC		VIKTAR PATONICH		2630 CROPSEY AVE BROOKLYN NY 11214	10/30/2018	10/30/2023

DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC		VITO GARGANO		1535 RICHMOND AVE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC	****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		WAYNE LIVINGSTON JR	NORTH COUNTRY DRYWALL AND PAINT	23167 COUNTY ROUTE 59 DEXTER NY 13634	10/24/2016	10/24/2021
DOL	DOL	****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		WHITE PLAINS CARPENTRY CORP		442 ARMONK RD	06/12/2018	06/12/2023
DOL	DOL		WILLIAM C WATKINS		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		WILLIAM DEAK		C/O MADISON AVE CONSTR CO 39 PENNY STREETWEST ISLIP NY 11795	11/02/2016	11/02/2021
DOL	DOL	*****6195	WILSON BROTHER DRYWALL CONTRACTORS		36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL	****4043	WINDSHIELD INSTALLATION NETWORK, INC.		200 LATTA BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	****4730	XGD SYSTEMS, LLC	TDI GOLF	415 GLAGE AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL	*****7345	YES SERVICE AND REPAIRS CORPORATION		145 LODGE AVE HUNTINGTON STATION NY 11476	08/09/2016	08/09/2021
DOL	DOL		YURIY IVANIN		C/O MOUNTAIN'S AIR INC 2471 OCEAN AVENUE-STE 7ABROOKLYN NY 11229	09/24/2012	09/18/2020
DOL	NYC		ZAKIR NASEEM		30 MEADOW ST BROOKLYN NY 11206	10/10/2017	10/10/2022
DOL	NYC	****8277	ZHN CONTRACTING CORP		30 MEADOW ST BROOKLYN NY 11206	10/10/2017	10/10/2022

SECTION 01 10 00- SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

- 1. Project information.
- 2. Work Covered by Contract Documents.
- 3. Phased Construction.
- 4. Work under separate contracts.
- 5. Access to site.
- 6. Coordination with occupants.
- 7. Work restrictions.
- 8. Specification and Drawings Conventions.
- B. Related Requirements: Refer to the Following Specification Sections for additional information.
 - 1. Section 00 90 00 "Construction Milestone Schedule
 - 2. Section 01 15 00 "Summary of Multiple Primes".
 - 3. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
 - 4. Section 01 35 16 "Phasing and Alteration Project

1.2 PROJECT INFORMATION

- A. Project Identification: Reconstruction to Dobbs Ferry Middle High school and Springhurst Elementary School.
 - 1. Project Location:
 - a) Springhurst Elementary School, 175 Walgrove Avenue, Dobbs Ferry, NY 10522
 - b) Dobbs Ferry Middle High School, 505 Broadway, Dobbs Ferry, NY 10522
- B. Owner: Board of Education of Dobbs Ferry Union Free School District.

Address: 505 Broadway, Dobbs Ferry, NY 10522

C. Architect: Tetra Tech Engineers, Architects & Landscape Architect, P.C., d/b/a Tetra Tech Architects & Engineers.

Address: Cornell Business & Technology Park, 10 Brown Road, Ithaca, NY 14850

D. Construction Manager: Calgi Construction Company, Inc.

Address: 56 Lafayette Avenue, Suite 350, White Plains, NY 10603

E. Project Coordinator for Multiple Contracts: Calgi Construction Company has been engaged by the Owner to serve as Project Coordinator

- F. Other Consultants: The Owner has retained the following who have prepared designated portions of the Contract Documents:
 - 1. Hazardous Materials Abatement: Enviroscience Consultants, Inc. Address: 37 Moore Avenue, Mt. Kisco, NY 10549
 - 2. Theatrical Consultants: Theatre Projects, Inc. Address: 476 Water Street, South Norwalk, CT. 06854

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of the Project is defined by the Contract Documents and consists of the following:
 - 1. For Springhurst Elementary School: SED# 66-04-03-03-0-004-018

 All Work at Springhurst Elementary School to be COMPLETED by end of August, 2021.
 - a) <u>Contract No. SES-1</u> General Construction Single Prime Contract
 The Work: Construction of a Secured Vestibule and Library Enhancements.
 - b) <u>Contract No. SES-2</u> Site Work Construction Single Prime Contract

 The Work: Construction of Visitor entrance Driveway Sidewalk and Varsity

 Softball Field
 - 2. For Middle High School: SED# 66-04-03-03-0-001-019

 All Work at Middle High School to be Phased and completed as noted:
 - a) <u>Contract No. MHS-1</u> GENERAL CONSTRUCTION CONTRACT The Work:
 - **Phase 1**: Site Work, General Construction work related to HVAC System Upgrades and Auditorium Upgrades.

COMPLETEION BY END OF AUGUST 2021.

- Phase 2: Site Work and Exterior Work (School Year 2021-2022 Second Shift After 3:30 PM)
- **Phase 3:** General Construction Works Related to HVAC System Upgrades. **COMPLETION BY END OF AUGUST 2022**
- b) <u>Contract No. MHS-2</u> ROOFING CONSTRUCTION PRIME CONSTRUCTION The Work:
 - **Phase 1**: Roofing Replacement and Roof Drain Replacement. Roof Areas 2&4 COMPLETEION BY END OF AUGUST 2021.
 - Phase 2: No Work (School Year 2021-2022 Second Shift After 3:30PM)
 - **Phase 3:** Roofing Replacement and Roof Drain Replacement. Roof Areas 1&3 **COMPLETION BY END OF AUGUST 2022**

c) <u>Contract No. MHS-3</u> MECHANICAL (HVAC) CONSTRUCTION PRIME CONTRACT The Work:

Phase 1: Mechanical (HVAC) System Upgrades and Auditorium Upgrades.

COMPLETEION BY END OF AUGUST 2021.

Phase 2: Steam Control Valves and Rough-In of Piping

(School Year 2021-2022 Second Shift After 3:30PM)

Phase 3: Mechanical (HVAC) System Upgrades

COMPLETION BY END OF AUGUST 2022

d) <u>Contract No. MHS-4</u> ELECTRICAL CONSTRUCTION PRIME CONTRACT The Work:

Phase 1: Electrical Works Related to the HVAC System Upgrades and Auditorium Upgrades.

COMPLETEION BY END OF AUGUST 2021.

Phase 2: No Work (School Year 2021-2022 Second Shift After 3:30PM)

Phase 3: Electrical Works Related to the HVAC System Upgrades and Auditorium Upgrades.

COMPLETION BY END OF AUGUST 2022

- B. Type of Contract: The Project will be constructed under Six (6) separate Prime Contracts.
 - 1. SES 1 (GC) General Contract: Springhurst Elementary School
 - 2. SES 2 (SC) Site Work Contract: Springhurst Elementary School
 - 3. MHS 1 (GC) General Contact: Middle High School
 - 4. MHS 2 (RC) Roofing Contract: Middle High School
 - 5. MHS 3 (MC) Mechanical (HVAC) Contract: Middle High School
 - 6. MHS 5 (EC) Electrical Contract: Middle High School

1.4 ACCESS TO SITE

- A. General: Contractors shall have limited use of Project Site for construction operations as indicated on Drawings by the Contact limit lines and as indicated by requirements of this Section as well as other Related Sections herein.
- B. Use of Site: Limit use of Project Site to area within the Contract limit lines indicated. Do not disturb portions of the Project Site beyond area in which the Work is indicated.
 - 1. Driveways, Walkways and Entrances: Keep driveways, loading areas and entrances serving premises clear and available to Owner (District), Faculty, Students and Emergency Vehicles at all time. Do NOT use these areas for parking or for storage of materials, tools and equipment.
- C. Conditions of Existing Building: Maintain portions of existing building(s) affected by construction operations in a weathertight condition throughout the construction period. Repair any and all damage caused by construction operations

1.5 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building(s) during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations, Maintain existing exists unless otherwise indicated.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on sue of public streets and with other requirements of authorities having jurisdiction

B. On-Site Hours:

- 1. Summers 2021 and 2022: Limit work in the existing building and Site to normal business working hours of 07:30 AM to 08:00 PM, Monday through Friday unless otherwise indicated.
- 2. School Years 2021 and 2022: Limit all work, deliveries, etc. to Second Shift Work hours from 03:30 PM to 11:30 PM, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupies by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Construction Manager not less than two (2) days in advance of proposed utility interruptions.
 - 2. Obtain Construction Manager's written permission before proceeding with utility interruptions.
- D. Nonsmoking Building: Smoking is not permitted within the Building(s) or within 25 feet of entrances, operable windows, or outdoor air intakes.
- E. Restricted Substances: Use of tobacco products and other controlled substances on Project site is NOT permitted.

1.7 SPECIFICATION\ ABD DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon

- (:) is used within a sentence or phrase.
- 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 15 00- SUMMARY OF MULTIPLE PRIME CONTRACTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.
- B. Related Sections include the following:
 - 1. Division 1 Section "Summary" for the Work covered by the Contract Documents, restrictions on use of the premises, Owner-occupancy requirements, and work restrictions.
 - 2. Division 1 Section "Administration Requirements" for general coordination requirements.
 - 3. Division 1 Section "Temporary Facilities and Controls" for specific requirements for temporary facilities and controls.

1.03 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weather-tight; exterior walls are insulated and weather-tight; and all openings are closed with permanent construction or substantial temporary closures.
- B. Contract Award: The date of award for each prime contract by the Owner, is the date of the Owner/Contractor Agreement.

1.04 PROJECT INFORMATION

- A. Project Identification: Reconstruction to Dobbs Ferry Middle High School and Springhurst Elementary School.
 - 1. Project Location:
 - a. Springhurst Elementary School, 175 Walgrove Avenue, Dobbs Ferry, NY 10522
 - b. Dobbs Ferry Middle High School, 505 Broadway, Dobbs Ferry, NY 10522
- B. Owner: Board of Education of Dobbs Ferry Union Free School District

Address: 505 Broadway, Dobbs Ferry, NY 10522

C. Architect: Tetra Tech Engineers, Architects & Landscape Architects, P.C., d/b/a Tetra Tech Architects & Engineers.

Address: Cornell Business & Technology Park, 10 Brown Road, Ithaca, New York 14850

D. Construction Manager: Calgi Construction Management

Address: 56 Lafayette Avenue, Suite 350, White Plains, NY 10603

Construction Manager has been engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and each Contractor, according to a separate contract between Owner and Construction Manager.

- E. Other Owner Consultants: The Owner has retained the following who have prepared designated portions of the Contract Documents:
 - 1. Hazardous Materials Abatement: Enviroscience Consultants, Inc.

Address: 37 Moore Avenue, Mt. Kisco, NY 10549.

2. Theatrical Consultant: Theatre Projects, Inc.

Address: 47 Water Street, South Norwalk, CT 06854.

F. Commissioning Authority: To Be Determined

Address: To Be Determined

Commissioning Authority will be engaged for this Project to provide commissioning services, according to provisions of Division 01 Section "General Commissioning Requirements."

G. Building Code in Effect for Project: New York State Uniform Fire Prevention and Building Code and the Energy Conservation Code of New York State.

Comply with the following: Building standards of the New York State Education Department

1.05 COORDINATION

- A. Project Coordinator shall be responsible for coordination between the General Construction Contractor, Site Work Contractor, Roofing Contractor, Mechanical Contractor and Electrical Contractor.
 - 1. Construction Manager shall act as Project Coordinator.

1.06 PROJECT COORDINATOR

- A. Project Coordinator: Full-time Project Coordinator.
 - 1. Coordination activities of Project Coordinator include, but are not limited to, the following:
 - a) Provide overall coordination of the Work.
 - b) Coordinate shared access to workspaces.
 - c) Coordinate product selections for compatibility.
 - d) Provide overall coordination of temporary facilities and controls.
 - e) Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
 - f) Coordinate construction and operations of the Work with work performed by each contract and Owner's construction forces.

- g) Coordinate preparation of Coordination Drawings prepared by each contractor to coordinate their work with each other.
- h) Coordinate sequencing and scheduling of the Work. Include the following:
 - i. Initial Coordination Meeting: At earliest possible date, arrange and conduct a meeting with separate Prime Contractors for sequencing and coordinating the Work; negotiate reasonable adjustments to schedules.
 - ii. Review the individual schedules provided by the Multiple Prime Contractors and incorporate the activities of the owner and architect. Provide amended schedules to:
 - a) SES- To both the Contractor for General Construction and Site Work Construction who both shall then prepare their individual Master Schedules.
 - b) MHS- To the Contractor for Mechanical (HVAC) Construction who shall then prepare the overall Master Schedule.
 - iii. Distribute copies of the Master Schedules to the Architect, Owner, and separate Prime Contractors.
- i) Provide photographic documentation.
- j) Coordinate quality-assurance and quality-control services specified in Division 1 Section "Quality Requirements."
- k) Coordinate sequence of activities to accommodate tests and inspections, and coordinate schedule of tests and inspections.
- 1) Coordinate cutting and patching.
- m) Coordinate protection of the Work.
- n) Coordinate completion of interrelated punch list items.
- Coordinate preparation of Project Record Documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
- p) Collect Record Specification Sections from other contractors, collate Sections into numeric order, and submit complete set.
- q) Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
- r) Coordinate sharing access to workspaces by General Construction Contract, Site Work Contract, Mechanical Contract and Electrical Contract Prime Contractors.
- s) Coordinate installation of mechanical and electrical work into limited spaces.

1.07 GENERAL REQUIREMENTS OF MULTIPLE PRIME CONTRACTS

A. Extent of Contract: Unless the Agreement contains 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.

Unless otherwise indicated, the Work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.

- 1. Local custom and trade union jurisdictional settlements do not control the scope of the Work of each 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.
- 2. Excavation and Back fill of Trenches for the Work of each contract shall be provided by each contract for its own Work to 5"-0" outside the building footprint. Electrical Contract to provide excavation and backfill of their trenches beyond the 5'-0" If line.
- 3. Cutting and Patching: Provided by each contract for its own Work.
- 4. Through-penetration firestopping for the Work of each contract shall be provided by each contract for its own Work.
- 5. Each Prime Contract is required to coordinate openings in any new walls and roof with the General Construction Contract.
- 6. Within ten (10) working days after coordinated construction schedule, prepared by the Mechanical (HVAC) Contractor for the MHS Project, has been received from the Project Coordinator, review and submit any and all comments, amendments to, and/or acceptance of said schedule to the Project Coordinator. The Project Coordinator shall then provide the information to the Mechanical Contractor who shall then amend and reissue the amended schedule as necessary showing construction operations sequenced and coordinated with overall construction.
- 7. Project closeout requirements.
- B. Substitutions: Each Prime Contractor shall cooperate with other contractors involved on the Project to coordinate approved substitutions with remainder of the Work.
- C. Temporary Facilities and Controls: Indicated in Division1 Section "Temporary Facilities and Controls," each Prime Contractor is responsible for the following:
 - 1. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, and costs and use charges associated with each facility.
 - 2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
 - 3. Its own field office, complete with necessary furniture, utilities, telephone and internet services. Electrical service shall be brought in from temporary panel located 100 feet within property line to own field office.
 - 4. Its own storage and fabrication sheds.
 - 5. Temporary enclosures for its own construction activities.
 - 6. Hoisting facilities for its own construction activities.
 - 7. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary or other harmful waste materials.
 - 8. Progress cleaning of its own areas on a daily basis.
 - 9. Temporary fire-protection equipment including fire extinguishers.
 - 10. Secure lockup of its own tools, materials, and equipment.
 - 11. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- D. Temporary Heating, Cooling, and Ventilation: Each Contractor is responsible for temporary heating, cooling and ventilation required for its own work. Owner will pay for utility-use charges.
- E. Use Charges: Comply with the following:
 - 1. Water Service: The Owner shall pay the cost for water service, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site.

- 2. Electric Power Service: Owner shall pay the cost for electric power service, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site with the following conditions:
 - a) The Owner shall pay for electric energy for temporary light and power except electric energy requiring more than single phase 400 amp service required for temporary trailers for duration of the project.
 - b) Any requirement for electric energy shall be provided by separate sources and completely paid for by each Prime Contractor requiring such power until primary service is installed.

1.08 CONSTRUCTION CONTRACTS

FOR SPRINGHURST ELEMENTARY SCHOOL SED# 66-04-03-03-0-004-018

A. Contract No. SES 1 – GENERAL CONSTRUCTION SINGLE PRIME CONTRACT

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

Phase 1 - Secured Vestibule and Library Enhancements (Completion End of August 2021)

- 1. Work is outlined on Drawings with the Sheet Identifiers: "G", "AG", "AA", "AS", "AM", "AE", "AP", "DES" and "ZE" and includes any and all interfacing work shown elsewhere on the remaining Contract Drawings: "AC", "AV", "ZC"
- 2. Unless noted otherwise, Work in the General Contract includes, but is not limited to, that covered by the following Specifications:
 - a. Division 01 (General Requirements) Specification sections.
 - b. Division 02 (Existing Conditions) Specification sections.
 - c. Division 03 (Concrete) Specification sections.
 - d. Division 04 (Masonry) Specification sections.
 - e. Division 05 (Metals) Specification sections.
 - f. Division 06 (Wood, Plastics, and Composites) Specification sections.
 - g. Division 07 (Thermal and Moisture Protection) Specification sections.
 - h. Division 08 (Openings) Specification sections.
 - i. Division 09 (Finishes) Specification sections.
 - j. Division 10 (Specialties) Specification sections, except the following:
 - 1) 10 14 53 Traffic Signage
 - k. Division 11 (Equipment) Specification sections, as follows:
 - 1) 11 52 13 Projection Screens
 - 1. Divison12 (Furnishings) Specification sections.
 - m. Division 22 (Plumbing) Specification sections, as follows:
 - 1) 22 05 00 Common Work Results for Plumbing
 - 2) 22 05 17 Sleeves and Sleeve Seals for Plumbing Piping
 - 3) 22 05 18 Escutcheons for Plumbing Piping
 - 4) 22 05 23 General Duty Valves for Plumbing Piping
 - 5) 22 05 29 Hangers and Supports for Plumbing Piping and Equipment

SUMMARY OF MULTIPLE PRIMES 01 15 00 - 5

- 6) 22 05 53 Identification for Plumbing Piping and Equipment
- 7) 22 07 19 Plumbing Piping Insulation
- 8) 22 11 16 Domestic Water Piping
- 9) 22 11 19 Domestic Water Piping Specialties
- 10) 22 11 23.21 Inline Domestic Water Pumps
- 11) 22 11 13 Facility Water Distribution Piping.
- 12) 22 13 19 Sanitary Waste Piping Specialties.
- 13) 22 14 23 Storm Drainage Piping Specialties.
- 14) 22 42 16 16 Commercial Sinks.
- k. Division 23 (Heating, Ventilating and Air Conditioning) Specification sections, except as follows:
 - 1) 23 01 20 Hydronic Systems Cleaning and Water Treatment
 - 2) 23 05 19 Meters and Gauges for HVAC Systems
 - 3) 23 21 13 Hydronic Piping
 - 4) 23 21 23 Hydronic Pumps
 - 5) 23 64 26 Rotary Screw Water Chillers
 - 6) 23 71 00 Thermal Storage Ice Tanks
 - 7) 23 73 13-prn Modular Indoor Central Station Air Handling Units
 - 8) 23 74 00 Packaged Outdoor Central Station Air handling Units
- 1. Division 26 (Electrical) Specification sections
- m. Division 28 (Electronic Safety and Security) Specification sections.
- 3. Preparation of coordination drawings, for use by other trades, in compliance with Division 1 Section "Administration Requirements":
 - a. SINGLE PRIME CONTRACTOR will allocate applicable portions of coordination drawings for the General Construction Work, Plumbing Work, Mechanical Work and Electrical Work for functional and spatial relationships of components of architectural, structural, civil, mechanical and electrical systems.
 - b. Indicate required installation sequences if necessary.
- 4. Preparation of overall Master Schedule upon completion of initial coordination meeting convened by the Project Coordinator. Update the Master Schedule monthly through project completion.
- 5. Interior metal stud framing and gypsum wall board.
- 6. Interior acoustical, gypsum wall board and specialty ceiling assemblies and suspension framing.
- 7. Interior construction, including partitions, doors, overhead doors interior glazed openings and fittings.
- 8. Fire-protection specialties.
- 9. Interior flooring and interior wall finishes, finish carpentry, architectural woodwork and built –in casework.
- 10. Ceramic tile floors and walls, if applicable.
- 11. Equipment noted as supplied by General Contractor as well as equipment noted to be supplied by Owner and installed by Genera Contractor.
- 12. Furnishings, including casework, millwork and floor mats.
- 13. Final cleaning as specified in Section "Execution and Closeout Procedures."

- 14. Miscellaneous specialties including, but not limited to the following:
 - a. Visual display surfaces and casework
 - b. Blocking as required.
 - c. Toilet and bath accessories, if applicable
 - d. Toilet Compartments, if applicable
 - e. Lockers and Gear Lockers, if applicable
 - f. Installation of necessary / required access doors.
- 15. Daily rubbish removal and final clean-up.

B. Contract No. SES 2 – SITE WORK CONSTRUCTION SINGLE PRIME CONTRACT

Work in the Site Work Construction Contract includes, but is not limited to, the following:

Phase 1 - Visitor Entrance Driveway Sidewalk and Varsity Softball Field (Completion End of August 2021)

- 1. Work is outlined on Drawings with the Sheet Identifiers: "G", "AG", "AV"< "AC", "AE", "ZC", "ZE" and includes any and all interfacing work shown elsewhere on the remaining Contact\Drawings: "AA", "AS", "AM", "AP", "DES".
- 2. Unless noted otherwise, Work in the Site Work Contract includes, but is not limited to, that covered by the following Specifications:
 - a. Division 01 (General Requirements) Specification sections.
 - b. Division 02 (Existing Conditions) Specification sections.
 - c. Division 03 (Concrete) Specification sections, as follows 1) 03 30 00 Cast-in-Place Concrete.
 - d. Division 04 (Masonry) Specification sections.
 - e. Division 09 (Finishes) Specification sections, as follows 1) 09 96 00 High Performance Coatings.
 - f. Division 10 (Specialties) Specification sections, as follow:
 - 1) 10 14 53 Traffic Signage
 - g. Division 11 (Equipment) Specification sections, as follow:
 - 1) 11 68 33.33 Baseball-Softball Athletic Field Equipment
 - h. Division 22 (Plumbing) Specification sections, as follows:
 - 1) 22 11 13 Facility Water Distribution Piping
 - 2) 22 11 23.21 Inline Domestic Water Pumps
 - i. Division 31 (Earthwork) Specification sections.
 - j. Division 32 (Exterior Improvements) Specification sections.
 - k. Division 33 (Utilities) Specification sections.
- 3. Preparation of coordination drawings, for use by other trades, in compliance with Division 1 Section "Administration Requirements":
 - a. SINGLE PRIME CONTRACTOR will allocate applicable portions of coordination drawings for the Site Work Construction, Plumbing Work, and Electrical Work for functional and spatial relationships of components of architectural, structural, civil, mechanical and electrical systems.
 - b. Indicate required installation sequences if necessary.

SUMMARY OF MULTIPLE PRIMES 01 15 00 - 7

- 4. Preparation of overall Master Schedule upon completion of initial coordination meeting convened by the Project Coordinator. Update the Master Schedule monthly through project completion.
- 5. Site preparation including, but not limited to, clearing, grubbing and earthwork as well as excavation for the construction of Visitor Entrance Driveway Sidewalk and Varsity Softball Field and all related earthwork.
- 4. Site improvements including, but not limited to, roadways, drainage structures & piping, asphalt paving, pedestrian paving, lawn areas, landscaping, site development furnishings and equipment
- 5. Water Main Services for Varsity Softball Field.
- 6. All Retaining Walls,
- 7. All Slabs-on-grade and Stairs-on-grade outside, including earthwork and insulation.
- 8. Site layout including verifying layout information shown on Drawings, in relation to the property survey and existing benchmarks. Locate and lay out reference points as indicated on Site drawings in Contract Documents.
- 9. Construction Layout including verifying layout information shown on Drawings, in relation to property survey and existing benchmarks. Locate and lay out reference points and control lines and levels for a starting point designated as per the Civil Drawings.
- 10. Foundations including footings and foundation walls.
- 11. Contractor must employ a licensed surveyor to perform layout and to provide certification of location of completed sidewalk and softball field. Provide a certified as-built survey and locating all underground lines including their relationships to exterior fixed point or existing building.
- 12. Exterior masonry construction, if applicable.
- 13. Exterior enclosure, including walls & associated finish.
- 14. Chain link fence.
- 15. Equipment noted as supplied by Site work Contractor as well as equipment noted to be supplied by Owner and installed by Site Work Contractor.
- 16. Final cleaning as specified in Section "Execution and Closeout Procedures."
- 17. Daily rubbish removal and final clean-up

1.09 CONSTRUCTION CONTRACTS

FOR MIDDLE HIGH SCHOOL SED# 66-04-03-03-0-001-019

A. **Contract No. MHS 1** – GENERAL CONSTRUCTION PRIME CONTRACT

Work in the General Construction Prime Contract includes, but is not limited to, the following:

- Phase 1 Site Work, General Construction Works Related to HVAC System Upgrades and Auditorium Upgrades (Completion End of August 2021)
- Phase 2 Site Work and Exterior Work (School Year 2021-2022 Second Shift After 3:30 PM)
- Phase 3 General Construction Works Related to HVAC System Upgrades (Completion End of August 2022)

- 1. Work is outlined on Drawings with the Sheet Identifiers "G", "BG", "BV", "BC", "BA", "BS", "AG", "TE", "TL", "TV", "DMSHS", and "ZC" and includes any and all interfacing work shown elsewhere on the remaining Contract Drawings: "BM", "BP", "BE", "BV" and "ZE".
- 2. Unless noted otherwise, Work in the General Contract includes, but is not limited to, that covered by the following Specifications:
 - a. Division 01 (General Requirements) Specification sections.
 - b. Division 02 (Existing Conditions) Specification sections.
 - c. Division 03 (Concrete) Specification sections.
 - d. Division 04 (Masonry) Specification sections.
 - e. Division 05 (Metals) Specification sections.
 - f. Division 06 (Wood, Plastics, and Composites) Specification sections.
 - g. Division 07 (Thermal and Moisture Protection) Specification sections.
 - h. Division 08 (Openings) Specification sections.
 - i. Division 09 (Finishes) Specification sections.
 - j. Division 10 (Specialties) Specification sections, as follows:
 - 1) 10 14 53 Traffic Signage
 - k. Division 11 (Equipment) Specification sections
 - 1. Division 12 (Furnishings) Specification sections
 - m. Division 22 (Plumbing) Specification sections
 - n. Division 23 (Heating Ventilating and Air Conditioning) Specification sections
 - o. Division 26 (Electrical) Specification sections
 - p. Division 27 (Communications) Specifications sections
 - q. Division 28 (Electronic Safety & Security) Specification sections
 - r. Division 31 (Earthwork) Specification sections
 - s. Division 32 (Exterior Improvements) Specification sections, except the following: 1) 32 84 00 Turf Irrigation
 - Division 33 (Utilities) Specification sections
- 2. Preparation of coordination drawings, for use by other trades, in compliance with Division 1 Section "Administration Requirements":
 - a. Project Coordinator will allocate applicable portions of coordination drawings to the General Construction Contractor, Roofing Contractor, Mechanical (HVAC) Contractor and Electrical Contract for functional and spatial relationships of components of architectural, structural, civil, mechanical and electrical systems.
 - b. Indicate required installation sequences if necessary.
- 3. Prepare an itemized schedule and amended schedules as necessary and provide to the Mechanical (HVAC) Contractor for incorporation into the Master Schedule. Schedules shall be updated monthly.
- 4. Site preparation includes, but not limited to, clearing, grubbing and earthwork as well as excavation for the building, HVAC dunnage and utilities and related earthwork.
- 5. Site improvements including, but not limited to, roadways, drainage structures, parking lots, asphalt paving, pedestrian paving, lawn areas, landscaping, site development furnishings and equipment
- 6. Dunnage structural for HVAC equipment.

- 7. All Retaining Walls,
- 8. Site layout including verifying layout information shown on Drawings, in relation to the property survey and existing benchmarks. Locate and lay out reference points as indicated on Site drawings in Contract Documents.
- 9. Construction Layout including verifying layout information shown on Drawings, in relation to property survey and existing benchmarks. Locate and lay out reference points and control lines and levels for structures, building foundations, column grids, and floor levels, including control lines and levels required from a starting point designated as per the Civil Drawings.
- 10. Foundations including footings and foundation walls.
- 11. Contractor must employ a licensed surveyor to perform building layout and to provide certification of location of completed foundation anchors. Provide via the required Submittals process a certified anchor bolt survey upon completion of all foundation work and prior to the start of steel erection. Upon completion of all sub/slab plumbing line installations, perform an as-built survey and provide a certified drawing locating all sub-slab lines including their relationships to all interior and exterior walls.
- 12. Exterior / interior masonry construction, columns, etc. with all necessary reinforcing, ties, etc.
- 13. Below-Grade building construction, including excavation, backfill and thermal and moisture protection.
- 14. Structural Steel Superstructure, including metal floors, and all applicable.
- 15. Exterior enclosure, including walls, parapets, door assemblies & associated finish hardware, exterior / interior windows and louvers, overhead doors and controls.
- 16. Interior metal stud framing and gypsum wall board.
- 17. Interior acoustical, gypsum wall board and specialty ceiling assemblies and suspension framing.
- 18. Interior construction, including partitions, doors, interior glazed openings and fittings.
- 19. Fire-protection specialties
- 20. Railings and finishes.
- 21. Interior flooring and interior wall finishes, finish carpentry, architectural woodwork and built –in casework.
- 22. Ceramic tile floors and walls, if applicable
- 23. Equipment noted as supplied by General Contractor as well as equipment noted to be supplied by Owner and installed by Genera Contractor.
- 24. Furnishings, including casework, millwork and floor mats.
- 25. Final cleaning as specified in Section "Execution and Closeout Procedures."
- 26. Miscellaneous specialties including, but not limited to the following:
 - a. Visual display surfaces and casework
 - b. Blocking as required.
 - c. Toilet and bath accessories, if applicable
 - d. Toilet Compartments, if applicable
 - e. Lockers and Gear Lockers, if applicable
 - f. Installation of necessary / required access doors.
- 30. Daily rubbish removal and final clean-up

B. Contract No. MHS 2 – ROOFING CONSTRUCTION PRIME CONTRACT

Work in the Roofing Construction Contract includes, but is not limited to, the following:

- Phase 1 Roofing Replacement and Roof Drain Replacement (Completion End of August 2021)
- Phase 2 No work (School Year 2021-2022 Second Shift After 3:30 PM)
- Phase 3 Roofing Replacement and Roof Drain Replacement (Completion End of August 2022)
- 1. Work is outlined on Drawings with the Sheet Identifiers "G", "BG", "BA", "BS", and "DMSHS", and includes any and all interfacing work shown elsewhere on the remaining Contract Drawings: "BC", "BM", "BP", "BE", "BV" "ZC" and "ZE", "TE", "TL", "TV".
- 2. Unless noted otherwise, Work in the General Contract includes, but is not limited to, that covered by the following Specifications:
 - a. Division 01 (General Requirements) Specification sections.
 - b. Division 02 (Existing Conditions) Specification sections.
 - c. Division 03 (Concrete) Specification sections
 - d. Division 04 (Masonry) Specification sections
 - e. Division 05 (Metals) Specification sections
 - f. Division 06 (Wood, Plastics, and Composites) Specification sections.
 - g. Division 07 (Thermal and Moisture Protection) Specification sections.
 - h. Division 08 (Openings) Specification sections.
 - i. Division 09 (Finishes) Specification sections.
 - j. Division 22 (Plumbing) Specification sections, as follows:
 - 1) 22 05 00 Common Work Results for Plumbing, as required for the Work of this Contract
 - 2) 22 05 17 Sleeves and Sleeve Seals for Plumbing Piping, as required for the Work of this Contract
 - 3) 22 05 29 Hangers and Supports for Plumbing Piping and Equipment, as required for the Work of this Contract
 - 4) 22 07 19 Plumbing Piping Insulation, as required for the Work of this Contract
 - 5) 22 14 23 Storm Drainage Piping Specialties, as required for the Work of this Contract.
 - k. Division 23 (Heating, Ventilating & Air Conditioning) Specification sections.
- 2. Preparation of coordination drawings, for use by other trades, in compliance with Division 1 Section "Administration Requirements.
 - a. Project Coordinator will allocate applicable portions of coordination drawings to the General Construction Contractor, Roofing Contractor Mechanical (HVAC) Contractor and Electrical Contractor for functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate required installation sequences if necessary.
- 3. Prepare an itemized schedule and amended schedules as necessary and provide to the Mechanical (HVAC) Contractor for incorporation into the Master Schedule. Schedules shall be updated monthly.

- 4. Roofing hazmat abatement and roof removal.
- 5. Roof deck replacement.
- 6. Roof drains replacement.
- 7. Skylights replacement.
- 8. Roof accessories, ladder, walkway pad, fascia, scupper, downspout and splash block etc.
- 9. New roofing.
- 10. Daily rubbish removal pertaining to this trade.

C. Contract No. MHS 3 – MECHANICAL (HVAC) CONSTRUCTION PRIME CONTRACT

Work in the Mechanical (HVAC) Construction Contract includes, but is not limited to, the following:

- Phase 1 Mechanical (HVAC) System Upgrades and Auditorium Upgrades (Completion End of August 2021)
- Phase 2 Steam Control Valves and Rough In of Piping (School Year 2021-2022 Second Shift After 3:30 PM)
- Phase 3 Mechanical (HVAC) System Upgrades (Completion End of August 2022)
- 1. Work is outlined on Drawings with the Sheet Identifiers "G", "BG", "BM", and includes any and all interfacing work shown elsewhere on the remaining Contract Drawings: "ZC" "BC", "BA", "BS", "BP", "BE", "AG", "BV", "ZE "TE", "TL", "TV" and "DMSHS",
- 2. Unless noted otherwise, Work in the General Contract includes, but is not limited to, that covered by the following Specifications:
 - a. Division 01 (General Requirements) Specification sections.
 - b. Division 02 (Existing Conditions) Specification sections.
 - c. Division 03 (Concrete) Specification sections.
 - d. Division 04 (Masonry) Specification sections.
 - e. Division 06 (Wood, Plastics, and Composites) Specification sections, as follows:
 - 1) 06 10 26 Roofing Rough Carpentry, as required for the Work of this Contract
 - f. Division 07 (Thermal and Moisture Protection) Specification sections, as follows:
 - 1) 07 21 00 Thermal Insulation, as required for the Work of this Contract.
 - 2) 07 53 23 EPDM Roofing, as required for the Work of this Contract.
 - 3) 07 72 00 Roof Accessories, as required for the Work of this Contract.
 - 4) 07 84 13 Penetration Firestopping, as required for the Work of this Contract.
 - 5) 07 92 00 Joint Sealants, as required for the Work of this Contract.
 - g. Division 09 (Finishes) Specification sections, as follows:
 - 1) 09 91 00 Painting, as required for the Work of this Contract.
 - 2) 09 96 00 High-Performance Coatings, as required for the Work of this Contract.
 - h. Division 22 (Plumbing) Specification sections
 - i. Division 23 (Heating, Ventilating and Air Conditioning) Specification sections
 - j. Division 26 (Electrical) Specification sections
 - k. Division 27 (Communications) Specification sections
 - 1. Division 28 (Electronic Safety & Security) Specification sections
- 3. Preparation of coordination drawings, for use by other trades, in compliance with Division 1 Section "Administration Requirements."

- a) Indicate elevations of HVAC systems (including piping and ductwork) with reference to finish floor elevations.
- b) Project Coordinator will allocate applicable portions of coordination drawings to the General Construction Contractor, Roofing Contractor, Mechanical (HVAC) Contractor and Electrical Contractor for functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
- c) Indicate required installation sequences if necessary.
- 4. Preparation of the Overall Master Schedule upon receipt of the other Prime Contractor's Schedules and upon completion of the initial coordination Meeting convened by the Project Coordinator. The Master Schedule shall be updated monthly through Project Completion.
- 5. HVAC piping systems
- 6. Heat generating equipment
- 7. Refrigeration equipment
- 8. Heating and Cooling terminal units
- 9. Air-Handling equipment including supply and exhaust fans
- 10. Air-Distribution systems, including supply and exhaust fans
- 11. Air distribution systems including:
- 12. Supply, return and exhaust
- 13. Terminal Outlets and accessories
- 14. Temperature control systems including control wiring.
- 15. Testing, adjusting and balancing HVAC systems and equipment
- 16. HVAC systems and equipment including rooftop equipment curbs and related vibration control curbs.
- 17. HVAC instrumentation and controls.
- 18. Starting / Commissioning HVAC systems and equipment Building automation system.
- 19. Gas piping distribution.
- 20. Mechanical connections to equipment furnished by the General Construction Contract, Fire Suppression Contract, Plumbing Contract and Electrical Contract.
- 21. HVAC Cutting and patching.
- 22. Daily rubbish removal pertaining to this trade.

D. Contract No. MHS 4 – ELECTRICAL CONSTRUCTION PRIME CONTRACT

Work in the Electrical Construction Contract includes, but is not limited to, the following:

- Phase 1 Electrical Works Related to HVAC System Upgrades and Auditorium Upgrades (Completion End of August 2021)
- Phase 2 No work (School Year 2021-2022 Second Shift After 3:30 PM)
- Phase 3 Electrical Works Related to HVAC System Upgrades (Completion End of August 2022)
- 1. Work is outlined on Drawings with the Sheet Identifiers "G", "BG", "BE" "ZE", "TE", "TL", "TV" and includes any and all interfacing work shown elsewhere on the remaining Contract Drawings: "BA", "BC", "BV", "ZC", "BS", "BP", "BM"and "DMSHS",
- 2. Unless noted otherwise, Work in the General Contract includes, but is not limited to, that covered by the following Specifications:
 - a. Division 01 (General Requirements) Specification sections.

SUMMARY OF MULTIPLE PRIMES 01 15 00 - 13

- b. Division 02 (Existing Conditions) Specification sections.
- c. Division 03 (Concrete) Specification sections.
- d. Division 06 (Wood, Plastics, and Composites) Specification sections.
- e. Division 07 (Thermal and Moisture Protection) Specification sections.
- f. Division 08 (Openings) Specification sections.
- g. Division 09 (Finishes) Specification sections.
- h. Division 11 (Equipment) Specification sections, as follows:
 - 1) 11 61 33 Theatrical Rigging
 - 2) 11 61 91 Theatrical Lighting Instruments and Accessories
- i. Division 22 (Plumbing) Specification sections
- j. Division 23 (HVAC) Specification sections
- k. Division 26 (Electrical) Specification sections
- 1. Division 27 (Communications) Specification sections
- m. Division 28 (Electronic Safety and Security) Specification sections
- 3. Preparation of coordination drawings, for use by other trades, in compliance with Division 1 Section "Administration Requirements"
 - a) Project Coordinator will allocate applicable portions of coordination drawings to the General Construction Contractor, Roofing Contractor, Mechanical (HVAC) Contractor and Electrical Contractor, for functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b) Indicate required installation sequences if necessary.
- 4. Prepare an itemized schedule and amended schedules as necessary and provide to the Mechanical contractor for incorporation into the Master Schedule. Schedules shall be updated monthly.
- 5. Power electrical distribution.
- 6. Interior lighting.
- 7. Electrical connections to equipment furnished by the General Construction Contract and Mechanical (HVAC) Contract.
- 8. Electrical cutting and patching
- 9. Daily rubbish removal pertaining to this trade.

1.10 MISCELLANEOUS

- A. Definition of extent of Prime Contract work: The Contract Documents indicate the extent of each prime contract. Except where the Contract Documents contain a more Specific description, general names and terminology on the Drawings and in the Specification Sections determine which prime contract includes a specific element of the Project.
- B. Local custom and trade union jurisdictional settlements do not control the scope of Work included in each 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. If it becomes necessary to refer to the contract documents to determine which prime Contract includes a specific element of required work, begin by referring to the prime Contracts, themselves; then, if a determination cannot be made from the prime Contracts, refer, in the following order, to the Supplementary Conditions, this section of the Specifications, followed by the SUMMARY OF MULTIPLE PRIMES 01 15 00 14

other Division-1 sections and finally with the Drawings and other Sections of the Specifications.

D. Summary of Reference: Work of the prime Contracts can be summarized by reference to the prime contracts, General Conditions, Supplementary Conditions, and Instructions to Modifications to the Contract Document issued subsequent to the initial printing of the Project Manual, and referenced by any of these. It is recognized that the work of the prime Contracts is unavoidably affected or influenced by governing regulations, natural phenomenon, including weather conditions, and other forces outside the contract documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 15 00

SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Contingency allowances.

1.3 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances.

1.4 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work.

1.6 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes.

- B. Allowance shall include cost to Contractor of specific products and materials under allowance and shall include taxes, freight, and delivery to Project site. Contractor's costs for receiving and handling at Project site, labor, installation, and similar costs related to products and materials under allowance shall be included as part of the allowance.
- C. Overhead and profit related to the allowance shall be included as part of the Contract Sum and not part of the allowance.

1.7 ALLOWANCE PROCEDURES

- A. Authorization for use of allowances is documented through Allowance Access Authorization form provided in the Project Manual, accompanied by substantiating data.
- B. At Project closeout, unused amounts remaining in the allowances will be credited to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.2 SCHEDULE OF ALLOWANCES – CONTRACT SES-1 (GC) – GENERAL CONTRACT

A. Allowance No. 1: Contingency Allowance: Include the sum of \$45,000 for use according to Owner's instructions and for hidden and unforeseen conditions discovered during construction.

3.3 SCHEDULE OF ALLOWANCES – CONTRACT SES-2 (SC) – SITE CONTRACT

A. Allowance No. 2: Contingency Allowance: Include the sum of \$50,000 for use according to Owner's instructions and for hidden and unforeseen conditions discovered during construction.

3.4 SCHEDULE OF ALLOWANCES – CONTRACT MHS-1 (GC) – GENERAL CONTRACT

A. Allowance No. 3: Contingency Allowance: Include the sum of \$120,000 for use according to Owner's instructions and for hidden and unforeseen conditions discovered during construction.

- 3.5 SCHEDULE OF ALLOWANCES CONTRACT MHS-2 (RC) ROOFING CONTRACT
 - A. Allowance No. 4: Contingency Allowance: Include the sum of \$100,000 for use according to Owner's instructions and for hidden and unforeseen conditions discovered during construction.
- 3.6 SCHEDULE OF ALLOWANCES CONTRACT MHS-3 (MC) MECHANICAL CONTRACT
 - A. Allowance No. 5: Contingency Allowance: Include the sum of \$300,000 for use according to Owner's instructions and for hidden and unforeseen conditions discovered during construction.
- 3.7 SCHEDULE OF ALLOWANCES CONTRACT MHS-4 (EC) ELECTRICAL CONTRACT
 - A. Allowance No. 6: Contingency Allowance: Include the sum of \$75,000 for use according to Owner's instructions and for hidden and unforeseen conditions discovered during construction.

3.8 SCHEDULE OF ALLOWANCES –ALL CONTRACTS

Allowance	Contract	Type	Amount
1	SES-1 (GC)	Contingency	\$45,000
2	SES-2 (SC)	Contingency	\$50,000
3	MHS-1 (GC)	Contingency	\$120,000
4	MHS-2 (RC)	Contingency	\$100,000
5	MHS-3 (MC)	Contingency	\$300,000
6	MHS-4 (EC)	Contingency	\$75,000

Attachment: Allowance Access Authorization

END OF SECTION 01 21 00

ALLOWANCE ACCESS AUTHORIZATIO	N:		
Project:			
Architect: Tetra Tech Architects & Engin	Project No. 234903-20001		
Contractor:			
AAA No.:	Initiation Date:		
The Allowance is allocated as follows:			
Total original Contract Allowance was: Amount of Contract Allowance Access previously a Adjusted Contract Allowance prior to this authoriza The amount of available Allowance will Decrease b The remaining Contract Allowance, after this Acces	tion is: \$ y this Access Authorization: \$		
Recommended by: Architect	Recommended by: Construction Manager		
By (Signature):	By (Signature):		
Date:	Date:		
Accepted by: Contractor	Approved by: Owner		
By (Signature):	By (Signature):		

Date:

END OF DOCUMENT 01 21 00

Date:

SECTION 01 22 00 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.2 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as 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.

Contract SES-1 (GC) General Construction

NO UNIT PRICES

Contract SES-2 (SC) Site Work Construction

1. Trench Rock Excavation

- a. Per cubic yard of Trench rock excavation according to Division 31 Section "Earthwork". Include replacement with approved materials.
- b. Volume of rock actually removed, measured in original position, but not to exceed the following:
 - 1) 24 inches outside of concrete forms
 - 2) 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide

2. Bulk Rock Excavation

- a. Per cubic yard of Bulk rock excavation according to Division 31 Section "Earthwork". Include replacement with approved materials.
- b. Volume of rock actually removed, measured in original position, but not to exceed the following:
 - 1) 24 inches outside of concrete forms other than at footings
 - 2) 12 inches outside of concrete forms at footings
 - 3) 6 inches outside of minimum required dimensions of concrete cast against grade
 - 4) Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments
 - 5) 6 inches beneath bottom of concrete slabs-on-grade

3. Concrete Slab-On-Grade

- a. Per square foot of concrete beyond indicated lines and dimensions as directed by Architect, according to Division 3 Section "Cast-in-Place Concrete" and Detail 12 on Drawing ZC501. Include work outside the perimeter of the building structure.
- b. Volume of material actually installed, measured in original position.

4. Replacement of Unsuitable On-Site Material

- a. Per cubic yard of unsuitable on-site material removed according to Division 31 Section "Earthwork". Include replacement with approved materials.
- b. Volume of unsuitable material actually removed, measured in original position.

Contract MHS-1 (GC) General Construction

1. Trench Rock Excavation

- a. Per cubic yard of Trench rock excavation according to Division 31 Section "Earthwork". Include replacement with approved materials.
- b. Volume of rock actually removed, measured in original position, but not to exceed the following:
 - 1) 24 inches outside of concrete forms
 - 2) 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide

2. Bulk Rock Excavation

- a. Per cubic yard of Bulk rock excavation according to Division 31 Section "Earthwork". Include replacement with approved materials.
- b. Volume of rock actually removed, measured in original position, but not to exceed the following:
 - 1) 24 inches outside of concrete forms other than at footings
 - 2) 12 inches outside of concrete forms at footings
 - 3) 6 inches outside of minimum required dimensions of concrete cast against grade
 - 4) Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments
 - 5) 6 inches beneath bottom of concrete slabs-on-grade

3. Replacement of Unsuitable On-Site Material

- a. Per cubic yard of unsuitable on-site material removed according to Division 31 Section "Earthwork". Include replacement with approved materials.
- b. Volume of unsuitable material actually removed, measured in original position.

4. Replacement of Retaining Wall

a. Per square foot of existing stone retaining wall removal and replacement per Detail 13 on Drawing ZC501 including all related materials.

5. Replacement of Chain Link Fencing

a. Per linear foot of existing 8"-0" high fencing removal and replacement per Detail 9 on Drawing ZC501 and Chain Link Fences and Gates, Section 32 31 13, specifications, including related work.

6. Access Doors and Frames at Gypsum Wallboard Walls and Ceilings

a. Per complete access door installation according to Division 8 Section "Access Doors and Frames".

7. Fire Rated Access Doors and Frames at Gypsum Wallboard Walls and Ceilings

a. Per complete fire-rated access door installation according to Division 8 Section "Access Doors and Frames".

8. Access Doors and Frames at Plaster Walls and Ceilings

a. Per complete access door installation according to Division 8 Section "Access Doors and Frames".

9. Fire Rated Access Doors and Frames at Plaster Walls and Ceilings

a. Per complete fire-rated access door installation according to Division 8 Section "Access Doors and Frames".

10. Abatement Unit Prices

- a. Complete abatement of the following materials and replacement with new equivalent non-ACM materials per specifications and to match existing. All work areas assumed to be adjacent to work areas required for contract abatement.
 - 1) Per square foot removal and replacement of ACM or presumed ACM plaster wall and ceiling finishes down to scratch coat.
 - 2) Per square foot removal and replacement of VAT
 - 3) Per square foot removal of roofing tar.
 - 4) Per square foot removal of roof flashing.

Contract MHS-2 (RC) Roof Construction

1. Replacement of Metal Roof Deck

- a. Per square foot of existing metal roof deck removal and replacement per Keynote No. 33 on Drawing BA190 including all related work
- 2. Roofing Tar Abatement
- 3. Roof Flashing Abatement

Contract MHS-3 (MC) Mechanical Construction

1. <u>Fin-tube Radiation</u>

a. Per linear foot for removal and replacement of existing fin tube radiators including related work.

2. <u>Ductwork</u>

- a. Galvanized Ductwork (square, round, etc), in \$/pound
- b. Aluminum Ductwork (square, round, etc), in \$/pound
- c. Plenum Ductwork, in \$/pound
- d. Duct Fittings and transitions (each type of duct, square, round, etc), in \$/lb
- e. Duct Insulation (each type as specified), in \$/sqft
- f. Duct internal Soundlining, in \$/sqft
- g. Fire-Smoke Dampers, in \$/sqft
- h. Volume dampers

Contract MHS-4 (EC) Electrical Construction

1. <u>Duplex Receptacle</u>

a. Per receptacle with wiring to nearest available receptacle circuit, back box, wires terminated and cover plate according to applicable Division 26 Sections.

2. Lighting Switch

- a. Per switch of each type listed below, with back box, wires terminated and cover plate according to applicable Division 26 Sections:
 - 1) Line voltage lighting switch
 - 2) Low voltage lighting switch

3. Occupancy Sensor

a. Per sensor with back box, wires terminated and cover plate according to applicable Division 26 Sections.

4. <u>Lighting Fixtures</u>

a. Per lighting fixture of each type according to applicable Division 26 Sections.

ENDOF SECTION 01 22 00

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. 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.

1.4 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.
- 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. Alternate No. SES-01: Site Lighting at Springhurst Elementary School
 - 1. This Alternate affects one Contract, as follows:
 - a. General Contract (GC) In addition to Work by Base Bid at Springhurst Elementary School visitor entrance driveway, provide new site lighting including light poles, wiring, conduit, pull box and associated improvement to install the site lighting improvements. Work as shown on Drawings AE001 and specified in Project Manual.
 - b. Site Contract: Not applicable
- B. Alternate No. MHS-01: 30-Year Warranty at Dobbs Ferry Middle / High School
 - 1. This Alternate affects one Contract, as follows:
 - a. Roofing Contract: At all areas requiring roofing at Dobbs Ferry Middle / High School, provide manufacturer's 30-year total system warranty. Refer to Specification Section 07 53 23 EPDM Roofing.
 - b. General Contract: Not applicable.
 - c. Mechanical Contract: Not applicable
 - d. Electrical Contract: Not applicable
- C. Alternate No. MHS-02: HVAC Improvements to Facilities, Accounting and Administration Offices 103, 103A, 105, 105A, 105B, 105C, 106, 106B, 108, 109.
 - 1. This Alternate affects one Contract, as follows:
 - a. Roofing Contract: Not applicable.
 - b. General Contract: Provide improvements associated with removal and installation of duct chase and associated components as indicated on Sheets BA100, BA101, BA130, BA160, BS131.

- c. Mechanical Contract: Provide improvements associated with installation cooling system and associated components as indicated on Sheets BM050, BM051, BM052, BM100, BM105, BM110, BM112, BM600, BM601, BM702.
- d. Electrical Contract: Provide improvements associated with removal and installation of duct chase and associated components as indicated on Sheets BE101, BE160, BE601.

END OF SECTION 01 23 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. 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 methods of construction from those required by the Contract Documents and proposed by Contractor.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 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.
 - b. 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.
 - 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. 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.
- k. 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.
- 3. 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 through Construction Manager 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.

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.

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 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution will not adversely affect Contractor's construction schedule.
 - c. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - d. Requested substitution is compatible with other portions of the Work.
 - e. Requested substitution has been coordinated with other portions of the Work.
 - f. Requested substitution provides specified warranty.
 - g. 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.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 45 days after the Notice to Proceed.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution does not require extensive revisions to the Contract Documents.

- b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- c. Requested substitution will not adversely affect Contractor's construction schedule.
- d. Requested substitution has received necessary approvals of authorities having jurisdiction.
- e. Requested substitution is compatible with other portions of the Work.
- f. Requested substitution has been coordinated with other portions of the Work.
- g. Requested substitution provides specified warranty.
- C. No substitution shall be approved during bidding. If directed by Owner after bid opening then Submit 00 43 33 Proposed Products From for consideration of equivalent products prior to award of contract.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue through Construction Manager supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Construction Manager.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

- 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- 4. Include costs of labor and supervision directly attributable to the change.
- 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
- 7. Work Change Proposal Request Form: Use form acceptable to Architect.

1.4 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Construction Manager will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Construction Manager may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 4. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 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 through Construction Manager at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- 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 schedule of values consistent with format of AIA Document G703.

- 3. 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.
 - a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
- 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.
- 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. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and Construction Manager and paid for by Owner.
 - 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- 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.
- C. Application for Payment Forms: Use AIA Document G702/CMa 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. Construction Manager will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

- E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Construction Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit conditional final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals 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 (preliminary if not final).
 - 4. Submittal schedule (preliminary if not final).
 - 5. List of Contractor's staff assignments.
 - 6. List of Contractor's principal consultants.
 - 7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 8. Initial progress report.
 - 9. Certificates of insurance and insurance policies.
- H. Typical Application for Payment submittal requirements which shall include:
 - 1. Waiver of Mechanic's Liens
 - 2. Current Construction Schedule
 - 3. Current Submittal Schedule
 - 4. Certified Payrolls
 - 5. Documentation of Stored Materials or Payments per Schedule of Values
- I. 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 Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. 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:

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- Evidence of completion of Project closeout requirements. 1.
- 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
- Updated final statement, accounting for final changes to the Contract Sum. 3.
- AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
- AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens." AIA Document G707-1994, "Consent of Surety to Final Payment."
- 6.
- Evidence that claims have been settled. 7.
- Final liquidated damages settlement statement. 8.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination drawings.
 - 2. Requests for Information (RFIs).
 - 3. Project Web site.
 - 4. Project meetings.

B. Related Requirements:

1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

A. RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.

- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor 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.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect and Construction Manager.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.

- D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect or Construction Manager 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 inaccurately prepared RFIs.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect and Construction Manager.
 - 4. RFI number including RFIs that were dropped and not submitted.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's and Construction Manager's response was received.
- F. On receipt of Architect's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT MEETINGS

- A. General: Construction Manager will schedule and conduct meetings and conferences at Project site weekly unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

- 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, and Architect, within three days of the meeting.
- B. Preconstruction Conference: Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 - 1. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Critical work sequencing and long-lead items.
 - c. Designation of key personnel and their duties.
 - d. Procedures for processing field decisions and Change Orders.
 - e. Procedures for RFIs.
 - f. Procedures for testing and inspecting.
 - g. Procedures for processing Applications for Payment.
 - h. Distribution of the Contract Documents.
 - i. Submittal procedures.
 - j. Preparation of record documents.
 - k. Use of the premises and existing building.
 - 1. Work restrictions.
 - m. Working hours.
 - n. Owner's occupancy requirements.
 - o. Responsibility for temporary facilities and controls.
 - p. Procedures for disruptions and shutdowns.
 - q. Construction waste management and recycling.
 - r. Parking availability.
 - s. Office, work, and storage areas.
 - t. Equipment deliveries and priorities.
 - u. First aid.
 - v. Security.
 - w. Progress cleaning.
 - 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
 - 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, Construction Manager of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.

- d. Related Change Orders.
- e. Purchases.
- f. Deliveries.
- g. Submittals.
- h. Possible conflicts.
- i. Compatibility problems.
- j. Time schedules.
- k. Weather limitations.
- 1. Manufacturer's written instructions.
- 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. Installation procedures.
- u. Coordination with other work.
- v. Required performance results.
- w. Protection of adjacent work.
- x. Protection of construction and personnel.
- 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
- 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
- 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Construction Manager will conduct progress meetings at regular intervals.
 - 1. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting.

 Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so.

 Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.

- 3) Status of submittals.
- 4) Deliveries.
- 5) Off-site fabrication.
- 6) Access.
- 7) Site utilization.
- 8) Temporary facilities and controls.
- 9) Progress cleaning.
- 10) Quality and work standards.
- 11) Status of correction of deficient items.
- 12) Field observations.
- 13) Status of RFIs.
- 14) Status of proposal requests.
- 15) Pending changes.
- 16) Status of Change Orders.
- 17) Pending claims and disputes.
- 18) Documentation of information for payment requests.
- 3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Construction schedule updating reports.
 - 3. Daily construction reports.
 - 4. Site condition reports.
 - 5. 2 Week look ahead

1.2 DEFINITIONS

- A. Activity: A specific itemized part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF electronic file.
- B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- D. Construction Schedule Updating Reports: Submit with Applications for Payment.
- E. Daily Construction Reports: Submit at weekly intervals.
- F. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for commencement of the Work to date of final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.
 - 5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

- 1. Phasing: Arrange list of activities on schedule by phase.
- 2. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
- D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Primavera Suretrak Schedule: Submit a comprehensive, fully developed, horizontal, Contractor's construction schedule within 30 days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. Approximate count of personnel at Project site.
 - 3. Equipment at Project site.
 - 4. Material deliveries.
 - 5. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 6. Accidents.
 - 7. Meetings and significant decisions.
 - 8. Unusual events.
 - 9. Stoppages, delays, shortages, and losses.
 - 10. Emergency procedures.
 - 11. Orders and requests of authorities having jurisdiction.
 - 12. Change Orders received and implemented.
 - 13. Construction Change Directives received and implemented.
 - 14. Services connected and disconnected.
 - 15. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

C. Provide a 2 week look ahead to the Construction Manager at each weekly project meeting

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
 - 1. Process designated submittals for the Project electronically through designated Electronic Submittal System. PDF files must be opened, viewed, modified and printed using Adobe Acrobat PDF software to view reviewer comments/stamps.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. As-Specified Products: Products to be incorporated into Project as specified by manufacturer name and product designation in Part 2 of technical specifications, intended to be installed as specified in Part 3 of technical specifications, and from a product category specifically identified as eligible to be considered as an "as-specified product" in the Action Submittals Article in Part 1 of technical specifications.
- C. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.
- E. Electronic Submittal System: A method to transmit certain electronic submittals between the Contractor, Construction Manager, Architect, and Owner, using Submittal Exchange website service.
 - 1. For consistency, the standard file format will be PDF. Convert paper originals and other file formats to PDF prior to submission.
 - 2. In the event of system malfunction, process submittals in accordance with the Architect's instructions, until the system malfunction has been corrected.

- 3. For this Project, process the following submittal types through the designated electronic submittal system:
 - a. Product Data.
 - b. Sustainable Design Submittals.
 - c. Shop Drawings.
 - d. Product Schedules.
 - e. Oualification Data.
 - f. Certificates (Welding, Installer, Manufacturer, Product, and Material, as applicable).
 - g. Test Reports (Material, Product, Preconstruction, Compatibility, and Field, as applicable).
 - h. Research Reports.
 - i. Warranty (sample).
 - j. Design Data, including calculations.
 - k. Coordination Drawings.
 - 1. Delegated-Design Services Certifications.
- 4. For Samples, provide electronic submittal of Sample cover sheet, identifying location and actual delivery date of Samples. Deliver Samples to location (Architect's office, Project site, etc.) as directed by the Architect.

1.4 COLOR SCHEDULE

A. Color Schedule: Within 30 days after date of Notice of Award, submit a complete list of proposed manufacturers and complete product designations (i.e. model, grade, series, product line, etc.) for each item requiring color selection by Architect.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Where indicated, submit all submittal items required for each Specification Section concurrently.
 - 3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- B. Processing Time: Allow sufficient time for submittal review, including time for resubmittals. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
- C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Include a cover sheet on each submittal item for identification. Do not combine different submittals under same cover sheet; only one submittal is to be provided per email.
 - a. Cover Sheet Form: Use PDF version of sample form included in Project Manual. Complete each item on form, sign and date. Architect will furnish PDF version of sample form.
 - 2. Name submittal file as directed by Architect.
 - 3. Transmit each submittal via Electronic Submittal System.
 - 4. Transmit each submittal to Architect using the Submittal Exchange website www.submittalexchange.com.
- D. Resubmittals: Make resubmittals in same form and, for non-electronic submittals, in the same number of copies as initial submittal.
 - 1. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 2. Resubmit submittals until they are marked with approval notation from Architect and Construction Manager.
 - 3. Refer to the General Conditions for provisions allowing Owner to obtain reimbursement from the Contractor for amounts paid to the Architect for evaluation of certain resubmittals.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities.
- F. Use for Construction: Retain complete electronic copies of submittals on Project site during Construction. Also maintain one complete set of hard paper copies of all approved submittals on Project site during Construction. Use only final action submittals that are marked with approval notation from Architect and Construction Manager.
- G. Use of As-Specified Verification Form: The As-Specified Verification Form is intended to reduce certain action submittal paperwork for select products to be incorporated into the Work. If product to be incorporated into Project is specified by name and product designation in Part 2 of the Technical Specification Section and is from a product category specifically identified as eligible to be considered as an "as-specified product" in the Action Submittals Article in Part 1 of technical specifications, submit "As-Specified Verification Form" attached to this Specification Section.

1.6 ENVIRONMENTAL REQUIREMENTS

A. All products provided for use in construction of this Project are to be free of asbestos. Refer to Division 01 Section "Closeout Procedures" for certification required to be provided. The Owner may provide random testing of installed products/ construction for asbestos content. Any Contractor-installed product found to contain asbestos shall be classified as defective work. Defective work shall be corrected by the Contractor as specified in the General Conditions.

1.7 SUBMITTAL PROCEDURES, GENERAL

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1.8 ELECTRONIC SUBMITTAL REQUIREMENTS

- A. Use the designated electronic submittal system for submittals in this Article.
 - 1. Review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
 - 2. Transmit each submittal to Construction Manager and Architect using the Submittal Exchange website, <u>www.submittalexchange.com</u>.
 - 3. For Action Submittals, Architect / Engineer and Construction Manager review comments will be made available on the Submittal Exchange website for downloading. Contractor will receive email notice of completed review.
 - 4. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
 - 5. After award of contract, training will be provided by Submittal Exchange regarding use of website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024.
 - 6. Internet Service and Equipment Requirements:
 - a. Email address and Internet access at Contractor's main office.
 - b. Adobe Acrobat (www.adobe.com), for applying electronic stamps and comments.
 - 7. Contractor shall bear the cost of the Submittal Exchange project subscription.
 - 8. Retain one electronic copy of all approved submittals, as part of the project records required at Project Closeout.
 - 9. Tetra Tech Architects and Engineers will be the Submittal Exchange Project Leader and Subscriber.

- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. Mark submittal to show which products and options are applicable.
 - 2. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Statement of compliance with specified referenced standards.
 - c. Testing by recognized testing agency.
 - 3. For equipment, include the following in addition to the above, as applicable:
 - a. Printed performance curves.
 - b. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
- C. As-Specified Submittals: Complete the "As-Specified Verification Form".
 - 1. Refer to the Action Submittals Article of technical specification sections. If the product to be incorporated into the Project is an "as-specified product" as defined in this Section, then submit "As-Specified Verification Form" in lieu of Product Data, otherwise submit full Product Data.
 - 2. Do not use "As-Specified Verification Form" unless specifically indicated in technical specification.
 - 3. The "As-Specified Verification Form" alone serves as the submittal for the specific product and no additional action submittal data is due at the time of the submittal. The full specific product technical data, however, is required to be included in the Operation and Maintenance Manual. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data".
- D. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of dimensions established by field measurement.
 - e. Relationship and attachment to adjoining construction clearly indicated.
 - f. Seal and signature of professional engineer if specified.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

- 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
- 2. Manufacturer and product name, and model number if applicable.
- 3. Number and name of room or space.
- F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

G. Certificates:

- 1. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- 2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- 4. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- 5. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

H. Test Reports:

- 1. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- 2. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- 3. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- 4. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

- 5. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- I. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- J. Warranty: Submit sample warranties as required in individual Specification Sections.
- K. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- L. Coordination Drawing Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- M. Delegated-Design Services Certification: Submit certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 NON-ELECTRONIC SUBMITTAL REQUIREMENTS

- A. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

- a. Number of Samples: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Deliver one set to Architect's office, deliver the other set to the construction trailer at the job site.
- 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit two sets of Samples. Deliver one set to Architect's office, deliver the other set to the construction trailer at the job site.
 - 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- B. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Submit subcontract list in the following format:
 - a. Number of Copies: Four paper copies of subcontractor list, unless otherwise indicated. Architect will return one copy.
- C. List of Key Personnel Names: No later than 15 days after date of Notice of Award, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site.
 - 1. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including emergency, office, and cellular telephone numbers and email addresses.
 - a. Number of Copies: Four paper copies of key personnel list, unless otherwise indicated.

1.10 MISCELLANEOUS SUBMITTAL REQUIREMENTS

A. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."

B. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

1.11 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.12 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Identify any deviations from Contract Document requirements. Mark cover sheet with approval before submitting to Architect and Construction Manager.
 - 1. Sign and date statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 - 2. If using Adobe Acrobat to electronically sign the Submittal Cover Sheet do not use the Certify Sign, Time Stamp feature as this will lock the document for further editing.

1.13 ARCHITECT'S AND CONSTRUCTION MANAGER'S ACTION

- A. General: Architect and Construction Manager will not review submittals that do not bear Contractor's approval and will return them without action.
- B. Action Submittals: Architect and Construction Manager will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect and Construction Manager will mark submittal appropriately to indicate action, as follows:
 - 1. Final Unrestricted Release: Where the submittal is marked "Approved," the Work covered by the submittal may proceed provided it complies with the Contract Documents. Final acceptance will depend on that compliance.
 - 2. Final-but-Restricted Release: Where the submittal is marked "Approved as Noted," the Work covered by the submittal may proceed provided it complies both with Architect's notations and corrections on the submittal and the Contract Documents. Final acceptance will depend on that compliance.
 - 3. Resubmit: Where the submittal is marked "Approved, Revise and Return Corrected Copies," the Work covered by the submittal may proceed provided it complies both with Architect's notations and corrections on the submittal and the Contract Documents. Revise submittal according to Architect's notations and corrections and return corrected copies. Final acceptance will depend on that compliance.

- 4. Rejected: Where the submittal is marked "Rejected," do not proceed with the Work covered by the submittal. Prepare a new submittal for a product that complies with the Contract Documents.
- 5. Incomplete Resubmit: Where the submittal is marked "Incomplete, Submit Additional Information," do not proceed with the Work covered by the submittal. Prepare additional information requested, or required by the Contract Documents, that indicates compliance with requirements, and resubmit.
- C. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Limit information submitted to specific products indicated. Do not submit extraneous matter. Submittals containing excessive extraneous matter will be returned for resubmittal without review.
- F. Submittals not required by the Contract Documents may be returned by the Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

Attachments: Cover Sheet

As-Specified Verification Form Delegated Design Submittal Form

END OF SECTION 01 33 00

CONTRACTOR:	SUBMITTAL DATE / /
ARCHITECT: Tetra Tech Architects & Engin	Check following as applicable: □ First Submission □ Re-submission
PROJECT IDENTIFICATION	RESERVED FOR USE BY TETRA TECH
Architect's	ACTION SUBMITTAL:
Project No.: 234903-20001	—— Approved
Proj. Name: Reconstruction Dobbs Ferry UFSD	
Location: Dobbs Ferry, New York	<u> </u>
PRODUCT IDENTIFICATION	☐ Approved, Revise and Return Corrected Copies
Specification Section No.	
A/E Submittal No.	—— □ Rejected
Name of Product:	Incomplete, Submit Additional Information
	INFORMATIONAL SUBMITTAL:
Name of Manufacturer:	No Action Taken
SUBCONTRACTOR	☐ Returned for Resubmittal
	Reviewed By:
SUPPLIER	Date:
	Reviewed only for the limited purpose of checking for conformance with information given and the design concept expressed in the Con-
RELATIONSHIP TO STRUCTURE Building Name	tract Documents. Review not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions
(Room #) (Room Name)	sibility of the Contractor as required by the Contract Documents. Review shall not constitute approval of safety precautions or of any
Contract Drawing No.:	construction means, methods, techniques, sequences or procedures
BEVIATION FROM CONTRACT BOCOMENTS.	
CONTRACTOR COMMENTS.	
CONTRACTOR COMMENTS:	
ARCHITECT'S COMMENTS:	
CONTRACTOR'S STAMP	CONTRACTOR'S CERTIFICATION I CERTIFY THAT THIS SUBMITTAL HAS BEEN REVIEWED AND APPROVED BY THE CONTRACTOR IN ACCORDANCE WITH THE GENERAL CONDITIONS. PRODUCTS/MATERIALS ARE FREE OF ASBESTOS AS REQUIRED BY THE CONTRACT DOCUMENTS.
	BY
	BY
	CM Submittal No. ————



As-Specified Verification Form

Project Number:	234903-20001			
Project Title:	Reconstruction Dobbs Ferry UFSD			
Technical Specification Section:	(Include Section Number and Title as shown in Project Manual)			
A/E Submittal No.:				
Specified Product:	(Include manufacturer's name and product designation)			
	in accordance with requirements sp	rants that the Specified Product listed above will be becified in the Technical Specification Section iden-		
submittals identified in the Te		s (hereinafter called Tetra Tech), agrees that limited tified above are not required, unless otherwise stated		
cation Form does not reliev remaining submittal docum	at use of this As-Specified Verifi- ve the Contractor from providing mentation required in Technical I information required in Division	RESERVED FOR USE BY TETRA TECH ACTION SUBMITTAL:		
	roject Manual or from complying	☐ Approved		
Products/Materials are free o tract Documents.	f asbestos as required by the Con-	☐ Rejected		
		Reviewed By:		
(Name of Contractor)		Date:		
(Authorized Signature)		Reviewed only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for		
(Title of Signatory)		installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. Review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences or procedures.		
(Date)				

DELEGATED DESIGN SUBMITTAL

CONTRACTOR:	SUBMITTAL DATE / /		
DESIGN PROFESSIONAL:	Check following as applicable: □ First Submission □ Re-submission		
ARCHITECT: Tetra Tech Architects & Engineers	RESERVED FOR USE BY TETRA TECH		
PROJECT IDENTIFICATION			
Architect's Project No.: 2234903-20001	ACTION SUBMITTAL:		
Proj. Name: Reconstruction Dobbs Ferry UFSD	☐ Approved		
Location: Dobbs Ferry, New York	☐ Approved As Noted		
PRODUCT IDENTIFICATION	☐ Approved As Noted		
Specification Section No.	☐ Approved, Revise and Return		
A/E Submittal No.	Corrected Copies		
Name of Product:	☐ Rejected		
Name of Manufacturer:	☐ Incomplete, Submit Additional Information		
SUBCONTRACTOR	INFORMATIONAL SUBMITTAL:		
SUPPLIER	_ □ No Action Taken		
RELATIONSHIP TO STRUCTURE	_ ☐ Returned for Resubmittal		
Building	Reviewed By:		
Name	_ Date:		
(Room #) (Room Name)	Reviewed only for the limited purpose of checking for conformance		
Contract Drawing No.:	with information given and the design concept expressed in the Con-		
DEVIATION FROM CONTRACT DOCUMENTS:	tract Documents. Review 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. Review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences or procedures.		
DESIGN PROFESSIONAL'S COMMENTS: CONTRACTOR COMMENTS: ARCHITECT'S COMMENTS:			
I certify that this submittal has been reviewed and approved by the Construction Manager in accordance with the General Conditions. BY	DESIGN PROFESSIONAL'S CERTIFICATION I certify that I am a design professional currently licensed in New York State and confirm my responsibility for work included in this submittal in accordance with the General Conditions. Further, I certify that to the best of my 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 construction standards of the Education Department. BY CONTRACTOR'S CERTIFICATION I certify that this submittal has been reviewed and approved by the Contractor in accordance with the General Conditions. Products/Materials Are free of asbestos as required by the Contract Documents.		

SECTION 01 35 16 - PHASING & ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes special procedures for alteration work for the following areas:
 - 1. SES-1 (GC) General Construction Springhurst Elementary School- Secured Vestibule and Library Enhancements
 - 2. SES-2 (SC) Site Work Construction Springhurst Elementary School-Visitor Entrance Driveway Sidewalk and Varsity Softball Field
 - 3. MHS-1 (GC) General Construction Dobbs Ferry Middle/High School-Site Work, General Construction Works Related to HVAC System Upgrades and Auditorium Upgrades
 - 4. MHS-2 (RC) Roofing Construction Dobbs Ferry Middle/High School-Roofing Replacement and Roof Drain Replacement
 - 5. MHS-3 (MC) Mechanical Construction Dobbs Ferry Middle/High School-Mechanical (HVAC) System Upgrades and Auditorium Upgrades
 - 6. MHS-4 (EC) Electrical Construction Dobbs Ferry Middle/High School-Electrical Works Related to HVAC System Upgrades and Auditorium Upgrades

1.2 PHASING

The Prime Contractors are responsible to review all contract documents and verify scope of work to furnish and install complete system for each Phase.

Phase 1 - Summer 2021

Work in the Phase 1 – Summer 2021 includes, but is not limited to, the following:

SPRINGHURST ELEMENTARY SCHOOL:

SES-1 (GC) General Construction "SINGLE PRIME CONTRACT"

• Secured Vestibule and Library Enhancements

SES-2 (SC) Site Work Construction "SINGLE PRIME CONTRACT"

• Visitor Entrance Driveway Sidewalk and Varsity Softball Field

MIDDLE/HIGH SCHOOL:

MHS-1 (GC) General Construction

- Asbestos Abatement
 - o HVAC Chase Work Area 1 & 2
- Interior Work
 - o HVAC Chase from Attic, Third Floor, Second Floor and above First Floor Ceiling.

PHASING & ALTERATION PROJECT PROCEDURES 01 35 16 - 1

- o Auditorium and Control Booth; Third Floor at Gallery; Penthouse Door.
- Ceiling work related to HVAC work.
- Site Work
 - o Walkway to Old Croton Aqueduct
 - o Site Drainage and Piping
 - Stone Retaining Wall
- Structural Work
 - o Foundation & Structural Steel for HVAC Dunnage
 - o Structural Steel Framing at Ceiling and Roofing Replacement Areas

MHS-2 (RC) Roofing Construction

- Work Area 2 Low Roof Area at Chiller, Stored Cooling Ice Tank, Penthouse with AHU-3HS & 4-HS & All Areas to the North and end at Corridor C-205.
- Work Area 4 High Roof Area.

MHS-3 (MC) Mechanical Construction

- C-1 Chiller, ICE Stored Cooling Ice Tank, P-1 & P-2 Pumps, ET-1 Expansion Tank, AS-1 Air Separator, GF-1 Glycol Fill Station, FCU-1 Fan Coil Unit, AHU-3HS, AHU-4HS, AHU-11HS, AHU-12HS, AHU-13HS, AHU-16HS, AHU-17HS, AHU-18HS with All AHU Coils & RHC Reheat Coils, RHC-21 & RHC-22 Reheat Coil, RTH-2HS Rooftop Hood, F-2HS Fan, CC-4HS & CC-5HS Duct Mounted Cooling Coil, Louver and Cleaning of all existing ducts within the work areas. Gas Piping and Water Piping Work.
- Work related to General Notes: Temporarily Remove Sidewall Register and Save for Reuse. Reinstall following completion of Duct Cleaning and Sealing Process.

MHS-4 (EC) Electrical Construction

- Site Work
 - o Remove Light Pole
- Interior Work
 - o Electrical work related the HVAC and Ceiling works.
 - o Auditorium Lighting and Power
 - Electrical work related to C-1 Chiller, ICE Stored Cooling Ice Tank, P-1 & P-2 Pumps, ET-1 Expansion Tank, AS-1 Air Separator, GF-1 Glycol Fill Station, FCU-1 Fan Coil Unit, AHU-3HS, AHU-4HS, AHU-11HS, AHU-12HS, AHU-13HS, AHU-16HS, AHU-17HS, AHU-18HS.

Phase 2 - School Year 2021-2022 "Second Shift - After 3:30 PM"

Work in the Phase 2 – School Year 2021-2022 includes, but is not limited to, the following:

MHS-1 (GC) General Construction

- Site Work (Complete Site Work & Exterior Work Started in Phase 1)
 - Walkway to Old Croton Aqueduct
 - o Site Drainage and Piping
 - o Stone Retaining Wall

MHS-3 (MC) Mechanical Construction

- Interior Work All areas remove existing steam control valves and install Two-Way Modulating Valves with control wiring.
- Piping Work Rough In of All piping needed for Phase 3 Summer 2022 work.

PHASING & ALTERATION PROJECT PROCEDURES 01 35 16 - 2

Phase 3 - Summer 2022 (Complete All Unfinished Work for All Prime Contractors)

Work in the Phase 3 – Summer 2022 includes, but is not limited to, the following:

MHS-1 (GC) General Construction

- Interior Work
 - o Penthouse Door
 - o Ceiling work related to HVAC work.
- Structural Work
 - o Structural Steel Framing at Ceiling and Roofing Replacement Areas.

MHS-2 (RC) Roofing Construction

• Work Area 1 and 3 - Low Roof Area at AHU-1HS, AHU-5HS, AHU-6HS, AHU-7HS, AHU-14HS and Connect with Work Area 2 - Low Roof Area that was done in Phase 1 Summer 2021 Roofing Work.

MHS-3 (MC) Mechanical Construction

AHU-1HS, AHU-2HS, AHU-5HS, AHU-6HS, AHU-7HS, AHU-8HS, AHU-9HS, AHU-10HS, AHU-14HS, AHU-15HS with All AHU Coils & RHC Reheat Coils, RHC-1 through 20 & RHC-23 through 25 Reheat Coil, RTH-1HS Rooftop Hood, F-1HS Fan, HC-1HS, HC-2HS, HC-3HS, HC-4HS Heating Coil, CC-1HS, CC-2HS, CC-3HS & CC-6HS Duct Mounted Cooling Coil, Louver and Cleaning of all existing ducts within the work areas. Gas Piping and Water Piping Work.

MHS-4 (EC) Electrical Construction

- Interior Work
 - o Electrical work related to HVAC and Ceiling work.
 - o Electrical work related to AHU-1HS, AHU-2HS, AHU-5HS, AHU-6HS, AHU-7HS, AHU-8HS, AHU-9HS, AHU-10HS, AHU-14HS and AHU-15HS.

1.3 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- C. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- D. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- E. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

PHASING & ALTERATION PROJECT PROCEDURES 01 35 16 - 3

- F. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- G. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- H. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- I. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- J. Retain: To keep existing items that are not to be removed or dismantled.

1.4 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, Construction Manager will conduct conference at Project site.
 - 1. Attendees: In addition to representatives of Owner, Construction Manager, Architect, and Contractor, testing service representative, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
 - 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
 - a. Fire-prevention plan.
 - b. Governing regulations.
 - c. Areas where existing construction is to remain and the required protection.
 - d. Hauling routes.
 - e. Sequence of alteration work operations.
 - f. Storage, protection, and accounting for salvaged and specially fabricated items.
 - g. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
 - 3. Reporting: Construction Manager will record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.

1.5 QUALITY ASSURANCE

- A. Alteration Work Program: Prepare a plan for alteration work for whole Project, including protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections.
 - 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.

- 2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
- B. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

1.6 STORAGE AND HANDLING OF SALVAGED MATERIALS

- A. Salvaged Materials:
 - 1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
 - 2. Pack or crate items after cleaning; cushion against damage during handling. Label 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.
- B. Salvaged Materials for Reinstallation:
 - 1. Repair and clean items for reuse as indicated.
 - 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label 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 unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
 - 1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
 - 2. Secure stored materials to protect from theft.
 - 3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F or more above the dew point.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
 - 3. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
 - 4. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
- B. Temporary Protection of Materials to Remain:
 - 1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
 - 2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
- C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

3.2 PROTECTION FROM FIRE

- A. General: Follow fire-prevention plan and the following:
 - 1. Comply with NFPA 241 requirements unless otherwise indicated.
 - 2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.
- B. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
 - 1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.3 GENERAL ALTERATION WORK

- A. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs or video recordings.
- B. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- C. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 013516

SECTION 01 35 26 – GOVERNMENTAL SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Safety requirements included in 8 NYCRR 155.5 Uniform Safety Standards for School Construction and Maintenance Projects.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Provide all measures, including (but not limited to) materials, equipment, and procedures, required to comply with following requirements of 8 NYCRR 155.5 Uniform Safety Standards for School Construction and Maintenance Projects.

B. Certificate of Occupancy:

- 1. 8 NYCRR 155.5 (a): "The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a certificate of occupancy."
- C. General Safety and Security Standards for Construction Projects:
 - 1. 8 NYCRR 155.5 (e)(1): "All construction materials shall be stored in a safe and secure manner."
 - 2. 8 NYCRR 155.5 (e)(2): "Fences around construction supplies or debris shall be maintained."
 - 3. 8 NYCRR 155.5 (e)(3): "Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry."
 - 4. 8 NYCRR 155.5 (e)(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. 8 NYCRR 155.5 (e)(5): "Workers shall be required to wear photo identification badges at all times for identification and security purposes while working at occupied sites."

D. Separation of Construction Areas from Occupied Spaces:

- 1. 8 NYCRR 155.5 (f): "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."
- 2. 8 NYCRR 155.5 (f)(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."

E. Cleaning Occupied Areas:

- 1. 8 NYCRR 155.5 (f)(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."
- 2. 8 NYCRR 155.5 (f)(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."

F. Exiting and Ventilation:

- 1. 8 NYCRR 155.5(g): Maintain exiting and ventilation during school construction projects.
- 2. 8 NYCRR 155.5(g)(1): "Required exits, temporary stairs, ramps, exit signs, and door hardware shall be provided at all times."
- 3. 8 NYCRR 155.5(g)(2): "Required ventilation to occupied spaces affected by construction will be maintained during the project."

G. Noise Control:

1. 8 NYCRR 155.5 (i): "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."

H. Control of Fumes, Gases and Contaminants:

1. 8 NYCRR 155.5 (j): The contractor shall be responsible for the control of chemical fumes, gases, and other contaminants produced by welding, gasoline or diesel engines, roofing, paving, painting, and other fumes to ensure they do not enter occupied portions of the building or air intakes.

- I. "Off-Gassing" of Volatile Organic Compounds:
 - 1. 8 NYCRR 155.5 (j)(1): The contractor shall be responsible to ensure that activities and materials which result in "off-gassing" of volatile organic compounds such as glues, paint, furniture, carpeting, wall coverings, drapery, etc. are scheduled, cured or ventilated in accordance with manufacturer's recommendations before a space can be occupied.

J. Asbestos Isolation:

- 1. 8 NYCRR 155.5 (k): "Large and small asbestos abatement projects as defined by 12 NYCRR 56 shall not be performed while the building is occupied." Note, it is NYSED's interpretation that the term "building", as referenced in this section of 8 NYCRR 155.5, means a wing or major section of a building that can be completely isolated from the rest of the building with sealed non-combustible construction. The isolated portion of the building must contain exits that do not pass through the occupied portion and ventilation systems must be physically separated and sealed at the isolation barrier.
- 2. Exterior work such as roofing, flashing, siding, or soffit work may be performed on occupied buildings provided proper variances are in place as required, and complete isolation of ventilation systems and at windows is provided. Care must be taken to schedule work so that classes are not disrupted by noise or visual distraction.

K. Lead and Asbestos Testing:

- 1. 8 NYCRR 155.5 (c)(1): "All school areas to be disturbed during renovation or demolition shall be tested for lead and asbestos."
 - a. Asbestos and Asbestos-Containing Materials:
 - 1) Be advised that asbestos and asbestos-containing materials are required to be abated as part of this Project. Refer to Division 02 Section "Asbestos Abatement".
 - a) The extent of asbestos to be abated as part of the Project is indicated on Drawings included in the Contract Documents.
 - b) Prior to beginning Work, review Owner's "Asbestos Management Plan" to ensure asbestos or asbestos-containing materials identified in that document are not disturbed.
 - 2) Be advised that if materials suspected to be asbestos, or to contain asbestos, that are not included in the Project and not identified in the Contract Documents are encountered during construction, immediately notify Owner and take precautions as required to avoid disturbing materials until directed by Owner.

3) Transmission Electron Microscopy (TEM): All asbestos abatement work that requires clearance air sampling in accordance with New York State Industrial Code Rule 56 shall have clearance air samples collected and analyzed using Transmission Electron Microscopy as per the Asbestos Hazard Emergency Response Act (40 CFR 763). Refer to Division 02 Section "Asbestos Abatement".

b. Lead and Lead-Containing Materials:

1) Be advised that a lead inspection has been performed as required by New York State Education Department and a copy of the lead inspection report is available at the Owner's offices.

L. Code Rule 56:

1. 8 NYCRR 155.5(k): "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."

M. Lead:

- 1. 8 NYCRR 155.5 (l): Surfaces that will be disturbed by reconstruction must have a determination made as to the presence of lead. Projects which disturb surfaces that contain lead shall have in the specifications a plan prepared by a certified Lead Risk Assessor or Supervisor which details provisions for occupant protection, worksite preparation, work methods, cleaning and clearance testing which are in general accordance with the HUD Guidelines.
 - a. Be advised that disturbance of lead and lead-containing materials is not anticipated as part of this Project.
 - b. Contractor is responsible for complying with requirements of all applicable federal, state and local regulations, including (but not limited to) OSHA Lead in Construction Standard 29 CFR 1926.62, when construction activities involve disturbance of materials containing 1.0 mg/sq cm or 0.5 percent of lead or less, including (but not limited to) lead-based paint, ceramic tile, and similar materials.
 - c. If materials suspected to contain lead above 1.0 mg/sq cm or above 0.5 percent that are not included in Project or identified in Contract Documents are encountered during construction, immediately notify Owner and take applicable precautions to avoid disturbing materials until directed by Owner.

N. Disposal of Lead Abatement Waste:

1. Test all debris from lead abatement activities to determine whether it is hazardous or non-hazardous waste.

- 2. Transport and dispose of debris determined to be hazardous waste in accordance with applicable regulations.
- 3. Package, label, and mark all hazardous waste materials in accordance with applicable requirements of 49 CFR 173, 178 and 179.
- 4. Maintain hazardous waste manifest from date of transport until date of disposal, destruction or recycling.
- 5. Return fully executed hazardous waste manifests to Owner within 60 days after date waste accepted by initial transporter.
- 6. Dispose of material determined to be Construction and Demolition Debris in accordance with 6 NYCRR 360 and 364. Provide trip tickets or other documentation clearly identifying generating site, Owner, transporter, disposal site and amount of material removed from site, transported to and disposed of at disposal site.
- 7. Refer to Division 02 Section "Lead-Safe Work Practices" for additional requirements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 35 26

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- E. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
- F. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

- A. Informational Submittals:
 - 1. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
 - 2. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - a. Specification Section number and title.
 - b. Entity responsible for performing tests and inspections.
 - c. Description of test and inspection.
 - d. Identification of applicable standards.
 - e. Identification of test and inspection methods.
 - f. Number of tests and inspections required.
 - g. Time schedule or time span for tests and inspections.

1.6 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.

- 4. Dates and locations of samples and tests or inspections.
- 5. Names of individuals making tests and inspections.
- 6. Description of the Work and test and inspection method.
- 7. Identification of product and Specification Section.
- 8. Complete test or inspection data.
- 9. Test and inspection results and an interpretation of test results.
- 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
- 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
- 12. Name and signature of laboratory inspector.
- 13. Recommendations on retesting and reinspecting.
- B. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect or Construction Manager.
 - 2. Notify Architect and Construction Manager seven (7) days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's and Construction Manager's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed unless otherwise indicated.

1.8 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

- 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
- 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
- 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting / Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

- 4. Facilities for storage and field curing of test samples.
- 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
- 6. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
 - 1. Distribution: Distribute schedule to Owner, Architect, Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.9 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:
 - 1. Notifying Architect, Construction Manager, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 2. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, through Construction Manager, with copy to Contractor and to authorities having jurisdiction.
 - 3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 4. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 5. Retesting and re-inspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.

- 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and Construction Manager's, reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

Attachment: Statement of Special Inspections

END OF SECTION 01 40 00



STATEMENT OF SPECIAL INSPECTIONS

Project: Reconstruction to Dobbs Ferry Middle High School and Springhurst Elementary School

Location: DOBBS FERRY, NEW YORK

Owner: DOBBS FERRY UNION FREE SCHOOL DISTRICT

This Statement of Special Inspections is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code of New York State. . It includes a schedule of Special Inspection services applicable to this project. Refer to individual technical specification sections for additional testing requirements.

This document includes the following parts:

Qualifications of Inspectors and Testing Technicians

Schedule of Special Inspection Services

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Qualifications* on the Schedule.

PE Structural Engineer – a licensed PE specializing in the design of building structures
PE/GE Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT Engineer-In-Training – a graduate engineer who has passed the Fundamentals of
Engineering examination

ACI-CFTT Concrete Field Testing Technician – Grade 1

ACI-CCI Concrete Construction Inspector

American Concrete Institute (ACI) Certification

ACI-LTT Laboratory Testing Technician – Grade 1&2

ACI-STT Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI Certified Welding Inspector

AWS/AISC-SSI Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT Non-Destructive Testing Technician – Level II or III.

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV

NICET-GET Geotechnical Engineering Technician - Levels I, II, III & IV

Association of the Wall and Ceilings Industries International (AWCI)

AWCI 12-B Standard Practice for the Testing and Inspection of Field Applied Thin-Film Intumescent Fire-Resistive Materials; an Annotated Guide.

Schedule of Special Inspection Services

INSPECTION AND TESTING ("Continuous" & "Periodic" defined by the Code; refer to applicable	REQUIRED (Required if checked; Not Applicable if not checked)	TECHNICAL SPECIFICATION SECTION (Refer to for additional information)	CONTINUOUS	PERIODIC
Technical Specification Section for specific frequency requirements)			Ö	Ь
Cast-in-Place Concrete (1705.3)				
1. Inspection of reinforcing steel and verify placement		03 30 00		\boxtimes
2. Inspection of reinforcing steel welding:			 	
a. Verification of ASTM A706 material		03 30 00		
b. Inspect single-pass fillet welds, maximum 5/16"		03 30 00		
c. Inspect all other welds		03 30 00	\boxtimes	
3. Inspection of anchors to be installed in concrete prior to and during placement		03 30 00		
4. Inspect anchors post-installed in hardened concrete				
a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.		03 30 00		
b. Mechanical anchors and adhesive anchors not defined in 4a.		03 30 00		
5. Verify use of required design mix		03 30 00		\boxtimes
6. Sampling fresh concrete for fabricating specimens for strength testing, perform slump and air content tests, and measure temperature of concrete		03 30 00		
7. Inspection of concrete and shotcrete placement for proper application techniques		03 30 00		
8. Verify maintenance of specified curing temperature and techniques		03 30 00		
9. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete, and prior to removal of shores and forms from beams and structural slabs		03 30 00		
10. Inspection of formwork for shape, location and dimensions of the concrete member being formed		03 30 00		
11. Inspection of post-tensioning operations		03 38 16		

Fabricated Items (1704.2.5 and 1705.10)				
1. Inspection of structural, load-bearing or lateral load-resisting		?? ?? ??		
members or assemblies as noted on Contract Documents that				
are fabricated in a fabricator's shop			ļ	<u>-</u>
Exceptions:				
a. The fabricator has been approved to perform work without				
special inspections per NYSBC 1704.2.5.1.				
b. The members or assemblies are to be fabricated on site. Then				
refer to the respective material categories for inspections. Masonry (1705.4)				
Wasoni y (1703.4)				
Level 1		04 20 00	 	
Lever		04 20 00		
1. Prior to construction, verify certificates of compliance used	П	04 20 00	П	
in masonry construction		0.2000		
Level 2 Level 3	Level 2	04 20 00		
	Level 3			
1. Prior to construction, verify compliance with the approved	П	04 20 00	П	П
submittals.				
2. Prior to construction, verify <i>f'm</i> , except where specifically		04 20 00		
exempted by the Code				
3. During construction, verify Slump flow and Visual Stability		04 20 00		
Index (VSI) when self-consolidating grout is delivered to				
the project site				
4. During construction, verify f'm for every 5,000 sqft		04 20 00	Ш	Ш
		04.20.00		
5. During construction, verify proportions of materials in		04 20 00	Ш	
premixed or preblended mortar, and grout other than self-				
consolidating grout, as delivered to the project site. 6. At start of masonry construction, verify to ensure				
compliance:				
a. Proportions of site prepared mortar.		04 20 00		
u. Proportions of site propured mortal.		0.12000		
b. Grade, type and size of reinforcement, connectors, and		04 20 00		
anchor bolts.	_			
c. Sample panel construction.		04 20 00		
7. Prior to grouting, verify that the following are in compliance:			<u></u>	 <u></u>
a. Grout space		04 20 00	Ш	
	 			
b. Placement of reinforcement, connectors, and anchor		04 20 00	Ш	
bolts	 	04 20 00		<u></u>
c. Proportions of site-prepared grout		04 20 00	ш	
8. During construction, verify compliance of the following:				
a. Materials and procedures with the approved submittals.		04 20 00	- <u> </u>	
a. Materials and procedures with the approved submittals.		04 20 00		
b. Placement of masonry units and mortar joint construction.	·	04 20 00	· —	
,				
c. Size and location of structural members.		04 20 00		
			<u></u>	
d. Type, size and location of anchors including anchorage of		04 20 00		
masonry to structural members, frames or other				
construction				

e. Welding of reinforcing bars		04 20 00		
f. Preparation, construction and protection of masonry during cold or hot weather		04 20 00		
g. Placement of grout.		04 20 00		
9. Observe preparation of grout specimens, mortar specimens and/or prisms		04 20 00		
C4		1		
Structural Steel (1705.2.1) 1 Minimum ingrestions prior to yielding nor AISC 260		05 12 00		
1. Minimum inspections prior to welding per AISC 360 (including but not limited to material verification, welder qualification and fit-up of joints).		03 12 00		
2. Minimum inspections during welding per AISC 360	\boxtimes	05 12 00		
a. Placement and installation of steel headed stud anchors		05 12 00		
b. Verification of ASTM A 706 material		05 12 00		
c. Testing of resisting flexural and axial forces in		05 12 00		
intermediate and special moment frames, and boundary				
elements of special reinforced concrete shear walls and				
shear reinforcement.				
3. Minimum inspections after welding per AISC 360 (including but not limited to size, length and location of welds; welds		05 12 00		
meet visual acceptance criteria; and repair activities)				
4. Inspection of welding via UT for CJP groove welds subject to transversely applied tension loading in butt, T-, and				
Corner joints		05.12.00		{ <u></u>
a. Risk Category III or IV structures	<u>\</u>	05 12 00	 ₩	├-낡
b. Risk Category II structures		05 12 00		
5. Minimum inspections prior to high-strength bolting (except for snug-tight joints) per AISC 360 (including but not limited to material verification of high-strength bolts, nuts, and washers; and bolting procedures)		05 12 00		
6. Minimum inspections during high-strength bolting (except	\boxtimes	05 12 00		
for snug-tight joints) per AISC 360 (included but not limited to assemblies and positioning)				
 a. For pretension/slip-critical connections using turn-of-nut with match marking method, direct-tension-indicator method, or twist-off-type tension control bolt method. 		05 12 00		
b. For pretension/slip-critical connections using calibrated wrench method or turn-of-nut method without matchmarking		05 21 00		
7. Minimum inspections after high-strength bolting per AISC 360	\boxtimes	05 21 00		
8. Inspection of fabricated and/or erected steel to verify		05 21 00	$\vdash \sqcap$	
compliance with the construction drawings.		03 21 00		
a. Details such as bracing and stiffeners		05 21 00	1	- M
b. Member locations		05 21 00	1	·-₩
c. Joint details	····· Š	05 21 00	1	
Inspection during placement of anchor rods and other		05 21 00		
embedded items supporting structural steel for compliance with	<u>~ 3</u>			╽╏
construction drawings.				
8. Material verification of structural steel: Identification	П	05 12 00		
markings to conform to ASTM standards specified in the	_		_	
approved construction documents				

Cold-Formed Steel Deck (1705.2.2)				
Inspection or Execution Tasks Prior to Deck Placement per SDI QA/QC (including but not limited to compliance of	\boxtimes	05 31 00		
materials with construction documents)				
2. Inspection or Execution Tasks After to Deck Placement per	\boxtimes	05 31 00		\boxtimes
SDI QA/QC (including but not limited to compliance of				
installation with construction documents)				
3. Inspection or Execution Tasks Prior to Welding per SDI	\boxtimes	05 31 00		\boxtimes
QA/QC (including but not limited to verification of				
procedures and certifications)				
4. Inspection or Execution Tasks During Welding per SDI	\boxtimes	05 31 00	\boxtimes	
QA/QC				
5. Inspection or Execution Tasks After Welding per SDI	\boxtimes	05 31 00		\boxtimes
QA/QC (including but not limited to size, length and location				
of welds; welds meet visual acceptance criteria; and repair				
activities)				
6. Inspection or Execution Tasks Prior to Mechanical Fastening	\boxtimes	05 31 00		\boxtimes
per SDI QA/QC (including but not limited to material				
verification)				
7. Inspection or Execution Tasks During Mechanical Fastening	\boxtimes	05 31 00	\boxtimes	
per SDI QA/QC (including but not limited to verification of				
positioning and installation)				
8. Inspection or Execution Tasks After Mechanical Fastening	\boxtimes	05 31 00	Ш	\boxtimes
per SDI QA/QC (including but not limited to verification of				
spacing, type and location; repair activities)				
Cold-Formed Steel Trusses (1705.2.4)				
1. For trusses spanning 60 feet or greater:				
a. Verify the temporary installation restraint/bracing is		05 40 00		
installed per the approved truss submittal package.	_		_	_
b. Verify the permanent individual truss member		05 40 00		
restraint/bracing is installed per the approved truss submittal			_	_
package.				
		•	l .	L L
Wood Construction (170505)				
1. For Metal-plate connected wood trusses spanning 60 feet or				
greater:				
a. Verify the temporary installation restraint/bracing is		06 10 00, 06 16 00,		
installed per the approved truss submittal package.		06 17 53		
b. Verify the permanent individual truss member		06 10 00, 06 16 00,		
restraint/bracing is installed per the approved truss		06 17 53		
submittal package.				
2. Inspect High-load diaphragms for grade and thickness of		06 10 00		\boxtimes
sheathing material; nominal size of framing members;				
fastener diameter and length; fastener layout and spacing				
Fire-Resistant Penetrations and Joints (1705.17)				
1. Inspection of through-penetrations and membrane	\boxtimes	07 84 13, 07 84 43		
penetration firestops in buildings in Risk Category III or IV				
per ASTM E2174				
2. Inspections of fire-resistant joint systems and perimeter fire	\boxtimes	07 84 13, 07 84 43		
barrier systems in buildings in Rick Category III or IV per				
ASTM E2393				

Soils (1705.6)				
1. Verify materials below shallow foundations are adequate to	\boxtimes	31 20 00		\boxtimes
achieve the design bearing capacity				
2. Verify excavations are extended to proper depth and have	\boxtimes	31 20 00		\square
reached proper material				
3. Perform classification and testing of compacted fill materials		31 20 00		\boxtimes
4. Verify use of proper materials, densities and lift thicknesses	\boxtimes	31 20 00		
during placement and compaction of compacted fill				
5. Prior to placement of compacted fill, inspect subgrade and	\boxtimes	31 20 00		
verify that site has been prepared properly				
Wind Resistance Inspections (1705.11)				
		T		ı
1. Structural wood – of elements in main windforce-resisting				
system				
a. Inspection of gluing operations.		06 10 00, 06 16 00,		Ш
		06 17 53		
b. Inspection of nailing, bolting, anchoring and other		06 10 00, 06 16 00,	Ш	
fastening		06 17 53		
2. Cold-formed steel light-frame construction – of elements in				
main windforce-resisting systems.			<u></u>	
a. Inspection of welding operations	<u> </u>	05 40 00	닖-	<u></u>
b. Inspection of screw attachment, bolting, anchoring and		05 40 00		\bowtie
other fastening				
3. Wind-resisting components:			<u></u>	<u></u>
a. Inspection of roof covering, roof deck and roof framing		05 12 00, 05 21 00,		
connections		05 31 00, 07 53 23	 <u></u>	
b. Inspection of exterior wall covering and wall connections		04 20 00, 07 24 13,		\boxtimes
to roof and floor diaphragms and framing		08 41 13, 08 44 13		

Seismic Resistance Inspections (1705.12)				
1 Stanistinal stock				
1. Structural steel: SDC B, C, D, E, or F – refer to 1705.12.1.1 for exceptions		05 12 00		
a. Seismic force-resisting systems – inspection in accordance	Ш	03 12 00		Ш
with AISC 341				
SDC B (R>3), C (R>3), D, E, or F		05 12 00		
b. Structural steel elements - inspection in accordance with	Ш	03 12 00		
AISC 341				
SDC C, D, E, or F, refer to 1705.12.2 for exceptions				
2. Structural wood, seismic-force-resisting systems:				
a. Inspection of field gluing operations.		06 10 00, 06 17 00,		
		06 17 53	ļ	
b. Inspection of nailing, bolting, anchoring and other		06 10 00, 06 17 00,		\square
fastening		06 17 53		
SDC C, D, E, or F, refer to 1705.12.3 for exceptions				
3. Cold-formed steel framing - of elements in seismic-force-				
resisting systems		0.5.40.00	 	
a. Inspection of welding operations of seismic-force-resisting		05 40 00	Ш	
systems		05.40.00	 	
b. Inspection of screw attachment, bolting, anchoring and other fastening		05 40 00	Ш	
SDC C, D, E or F; coord with 13.2.2 of ASCE 7		??		
4. Designated seismic systems – Inspection systems requiring	Ш	::		
Seismic Qualification per ASCE 7. Verify label, anchorage				
and mounting conforms to certificate of compliance				
5. Architectural components				
a. Inspection of erection and fastening of exterior cladding			<u> ГП</u>	×
b. Inspection of erection and fastening of interior and exterior	-		-F	
nonbearing walls	_			
c. Inspection of erection and fastening of interior and exterior				
veneer			ļ	
d. Access floors – inspection of anchorage				
6. Mechanical and electrical components:			 <u></u>	<u></u>
SDC C, D, E or F				\boxtimes
a. Inspection of anchorage of electrical equipment for	Ш			
emergency power systems			 	
SDC E or F			Ш	
b. Inspection of anchorage installation or other electrical				
equipment SDC C, D, E or F				<u></u>
c. Inspection of installation and anchorage of piping systems			Ш	
and associated mechanical units designed to carry				
hazardous materials				
SDC C, D, E, or F			· —	
d. Inspection of installation and anchorage of ductwork				
designed to carry hazardous materials				
SDC, C, D, E, or F				
e. Inspection of installation and anchorage of vibration				
isolation systems			<u> </u>	<u> </u>
SDC, C, D, E, or F				
f. Inspection of installation of mechanical and electrical				
equipment where automatic fire sprinkler systems are				
installed to verify clearances		1		

SDC B, C, D, E or F				\boxtimes
7. Seismic isolation system: Inspection during fabrication and				
installation of isolator units and energy dissipation devices				
that are part of the seismic isolation system				
SDC D, E or F				\boxtimes
8. Cold-formed steel special bolted moment frames: Inspection				
during installation of frames part of the seismic isolation				
system				
		:		
Seismic Resistance Structural Testing				
1. Structural steel:				
SDC B, C, D, E, or F		05 12 00		
a. Seismic force-resisting systems: Non-destructive testing in				
accordance with quality assurance requirements of AISC				
341			<u></u>	
b. Structural steel elements: nondestructive testing in		05 12 00		
accordance with the quality assurance requirements of				
AISC 341				
SDC B, C, D, E, or F				
2. Nonstructural Components: Confirm certification of				
compliance of seismic qualification for supports and	\boxtimes			
attachments has been submitted by manufacturer for				
specified systems				
SDC C, D, E or F		??		
3. Designated seismic systems: Confirm certification of				
compliance of seismic qualification has been submitted for				
designated seismic systems				
SDC B, C, D, E, or F	\bowtie			
4. Seismic isolation systems: Testing per ASCE 7, Section 17.8				
		•		
Structural Observations		<u> </u>		
One or more of: RC IV; high-rise building; special structures as	Ш			
determined by RDP; required by building official				
1. Structural observations for structures				
SDC D, E, or F where RC III or IV or				
SDC E where RC I or II and > 2 stories above grade plane	Ш			
2. Structural observations for seismic resistance				
V = 130 mph or greater and RC III or IV				
3. Structural observations for wind resistance				

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- 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. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
 - 1. DIN Deutsches Institut für Normung e.V.; www.din.de.
 - 2. IAPMO International Association of Plumbing and Mechanical Officials; <u>www.iapmo.org</u>.
 - 3. ICC International Code Council; <u>www.iccsafe.org</u>.
 - 4. ICC-ES ICC Evaluation Service, LLC; <u>www.icc-es.org</u>.
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
 - 1. COE Army Corps of Engineers; www.usace.army.mil.
 - 2. CPSC Consumer Product Safety Commission; www.cpsc.gov.
 - 3. DOC Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 - 4. DOD Department of Defense; www.quicksearch.dla.mil.
 - 5. DOE Department of Energy; <u>www.energy.gov</u>.
 - 6. EPA Environmental Protection Agency; <u>www.epa.gov</u>.
 - 7. FG Federal Government Publications; <u>www.gpo.gov</u>.
 - 8. GSA General Services Administration; <u>www.gsa.gov</u>.
 - 9. HUD Department of Housing and Urban Development; www.hud.gov.
 - 10. OSHA Occupational Safety & Health Administration; www.osha.gov.
 - 11. USPS United States Postal Service: www.usps.com.
- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.
 - 1. CFR Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 - 2. FED-STD Federal Standard; (See FS).
 - 3. FS Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 - 4. MILSPEC Military Specification and Standards; (See DOD).
 - 5. USAB United States Access Board; www.access-board.gov.

- E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
 - 1. SED State Education Department Facilities Planning, Room 1060 Education Building Annex, Albany, NY 12234
 - 2. NYCRR Codes Rules and Regulations of the State of New York, Department of State, 162 Washington Avenue, Albany, NY 12231

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Division 1 Section "Summary of Multiple Prime Contracts" for division of responsibilities
 - 3. for temporary facilities and controls.
 - 4. Division 1 Section "Submittal Procedures" for procedures for submitting copies of
 - 5. implementation and termination schedule and utility reports.
 - 6. Division 1 Section "Project Execution" for progress cleaning requirements.
 - 7. Divisions 2 through 33 Sections for temporary heat, ventilation, and humidity
 - 8. requirements for products in those Sections.
 - 9. Division 31 Section "Earthwork" for erosion and sedimentation control on Project site.
 - 10. Division 32 Section "Asphalt Paving" for temporary roads and paved areas.

1.2 DEFINITIONS

- A. Permanent Enclosures: As determined by Arhcitect, permanent or temporary roofing is completed.
- B. Insulated and weathertight; exterior walls are insulated and weathertight; and all opening are closed
- C. with permanent construction or substantial temporary closures;

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, Construction Manager, Consultants, Contractors, District Staff, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.

TEMPORARY FACILITIES AND CONTROLS 01 50 00 - 1

Include procedures for all Covid - 19 related regulations and procedures to assure compliance with state and local regulations

B. Site logistics Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel, storage of material and emergency vehicle egress. Update as necessary.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide galvanized-steel bases for supporting posts. Each contractor is responsible to provide security fence for its own material and equipment.
- B. Pavement: Comply with Division 32 pavement Sections.
- C. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry."
- D. Gypsum Board: Minimum 1/2 inch thick by 48 inches wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- F. Paint: Comply with requirements in Division 9 painting Sections.

2.2 TEMPORARY FACILITIES

A. Storage and Fabrication Sheds: Each contractor to provide sheds sized, furnished, and equipped to accommodate materials and equipment for their own construction operations.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will servie Project adequately and result in minimum interface performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
- B. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- C. Water Service: Connect to Owner's existing water service. Maintain equipment in a conditions acceptable to Owner.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- B. Waste Disposal Facilities: Each contractor is responsible for their own waste removal from the Project site and is to provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- C. Lifts and Hoists: Each Contractor to provide facilities necessary for hoisting materials, owner supplied material, and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- D. Temporary Elevator Use: Use of elevators is not permitted.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, walls, smart boards, windows, doors, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire prevention program.
 - 1. Prohibit smoking in construction areas.
 - 2. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities. All facilities to be COVID-19 compliant
 - 1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without out operating entire system.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, inservice performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor through Construction Manager of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

- 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
- 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

- 1. Store products to allow for inspection and measurement of quantity or counting of units.
- 2. Store materials in a manner that will not endanger Project structure.
- 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
- 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

- 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

- 1. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

2. Manufacturers:

- Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 Comparable products or substitutions for Contractor's convenience will be considered.
- b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
- 3. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.

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PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Installation of the Work.
 - 3. Cutting and patching.
 - 4. Progress cleaning.
 - 5. Protection of installed construction.

B. Related Requirements:

- 1. Section 011500 "Summary of Multiple Primes" for limits on use of Project site.
- 2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 - 2. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - 3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of inplace materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

- 1. Make vertical work plumb and make horizontal work level.
- 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

- 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
- 3. Proceed with patching after construction operations requiring cutting are complete.
- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. This Section includes procedural requirements for cutting and patching the Prime Contractor is responsible for their own cutting and finish patching.

1.3 RELATED SECTIONS

- A. Refer to Divisions 3 through 32 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - 1. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 22, 23 and 26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.4 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.5 SUBMITTALS

- A. Cutting and Patching: Submit a method describing procedures at least **10 days before** the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating c o m p o n e n t s a s well as c h a n g e s i n b u i l d i n g 's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.

- 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
- 7. Architect's Approval: Obtain approval of cutting and patching before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.6 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
 - 1. Provide a list of additional elements that are structural elements and that require Architect's or Construction Manager's approval of a cutting and patching proposal.
- B. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 - 1. Primary operational systems and equipment.
 - 2. Air or smoke barriers.
 - 3. Fire-protection systems.
 - 4. Control systems.
 - 5. Communication systems.
 - 6. Conveying systems.
 - 7. Electrical wiring systems.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - 1. Water, moisture, or vapor barriers.
 - 2. Membranes and flashings.
 - 3. Exterior curtain-wall construction.
 - 4. Equipment supports.
 - 5. Piping, ductwork, vessels, and equipment.
 - 6. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding

1.7 WARRANTY

A. Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void warranties.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. In-Place Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

- 2. In-Place Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
- Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
- 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
- 5. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - 4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
 - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty and similar materials.

END SECTION 017329

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Disposing of non-hazardous demolition and construction waste.
- B. Related Sections include the following:
 - 1. Division 01 Section "Temporary Facilities and Controls" for environmental-protection measures during construction, and location of waste containers at Project site.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 SUBMITTALS

A. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

B. Related Requirements:

- 1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
- 2. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.2 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

- 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
- 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
- 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Construction Manager. Label with manufacturer's name and model number where applicable.
- 5. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 3. Complete final cleaning requirements, including touchup painting.
 - 4. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for final completion.

1.5 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order,
 - 2. Submit list of incomplete items in the following format:
 - a. PDF electronic file. Architect, through Construction Manager, will return annotated copy.

1.7 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

- 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Sweep concrete floors broom clean in unoccupied spaces.
 - f. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - g. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - h. Remove labels that are not permanent.
 - i. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - j. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

END OF SECTION 017700

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Manual Format: Submit operation and maintenance manuals in the following format:
 - 1. Two paper copies as listed below.
 - 2. Two digital media copies, PDF format on thumb drive.
- B. Prior to submission of paper copies and thumb drives as listed above, submit electronic files in PDF format for review and approval.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

- 3. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
- 4. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.
- B. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

1.5 REQUIREMENTS FOR OPERATION AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title Page: Include the following information:
 - a. Subject matter included in manual.
 - b. Name and address of Project.
 - c. Date of submittal.
 - d. Name and contact information for Contractor.
 - 2. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - a. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
 - 3. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1.6 OPERATION AND MAINTENANCE MANUALS

- A. Operation Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - a. Product name and model number. Use designations for products indicated on Contract Documents.
 - b. Manufacturer's name.
 - c. Equipment identification with serial number of each component.
 - d. Equipment function.
 - e. Complete nomenclature and number of replacement parts.
 - 2. Operating Procedures: Include the following, as applicable:
 - a. Startup procedures.
 - b. Routine and normal operating instructions.
 - c. Regulation and control procedures.
 - d. Normal shutdown instructions.
 - e. Seasonal and weekend operating instructions.
 - f. Special operating instructions and procedures.
 - 3. Emergency Procedures: Include the following, as applicable:
 - a. Instructions on stopping.
 - b. Shutdown instructions for each type of emergency.
 - c. Operating instructions for conditions outside normal operating limits.
 - d. Special operating instructions and procedures.
 - 4. Wiring diagrams.
 - 5. Control diagrams.
 - 6. Piped system diagrams.
 - a. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.
 - 7. Precautions against improper use.
 - 8. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- B. Maintenance Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, manufacturers' maintenance documentation, maintenance and service schedules, spare parts list and source information, maintenance service contracts, repair materials and sources, and warranties and bonds, as described below.

- 1. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- 2. Product Information: Include the following, as applicable:
 - a. Product name and model number.
 - b. Manufacturer's name.
 - c. Color, pattern, and texture.
 - d. Material and chemical composition.
 - e. Reordering information for specially manufactured products.
- 3. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Schedule for routine cleaning and maintenance.
 - e. Repair instructions.
- 4. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - a. Standard maintenance instructions and bulletins.
 - b. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - c. Identification and nomenclature of parts and components.
 - d. List of items recommended to be stocked as spare parts.
- 5. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - a. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - b. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- 6. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- 7. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- 8. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

- 9. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - a. Include procedures to follow and required notifications for warranty claims.

1.7 MANUAL PREPARATION

- A. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- B. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- C. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
- D. Submittals: Include copy of each product submittal approved by Architect.
 - 1. If the "As-Specified Verification Form" was used as the product submittal, include all pertinent product data as described in this Section.
- E. Safety Data Sheets (SDS): Include copy of SDS for each product installed.
- F. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. Related Requirements:
 - 1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Record data as soon as possible after obtaining it.
 - c. Record and check the markup before enclosing concealed installations.
 - 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

- 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 - 1. Format: Annotated PDF electronic file.
 - 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect through Construction Manager for resolution.
 - 4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Format: Annotated PDF electronic file.
 - 2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 - 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Construction Manager.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

- 3. Note related Change Orders and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.
- C. Provide PDF copy of all Project Record Documents on Thumb Drive for Owner

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 017839

DOCUMENT 01 79 00-DEMONSTRATION AND TRAINING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

- 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
- 2. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. At completion of training, submit complete training manual(s) for Owner's use prepared in same paper and PDF file format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.

- h. Normal shutdown instructions.
- i. Operating procedures for emergencies.
- j. Operating procedures for system, subsystem, or equipment failure.
- k. Seasonal and weekend operating instructions.
- 1. Required sequences for electric or electronic systems.
- m. Special operating instructions and procedures.
- 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
 - 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
 - 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.7 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.8 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Construction Manager, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF DOCUMENT 017900

TECHNICAL SPECIFICATIONS

ASBESTOS ABATEMENT PROJECT AT:

DOBBS FERRY UFSD HIGH/MIDDLE SCHOOL 505 BROADWAY DOBBS FERRY, NY

Prepared for:

DOBBS FERRY UNION FREE SCHOOL DISTRICT

Prepared by:



37 MOORE AVENUE MT. KISCO, NY 10549

August 6th, 2020 Job No. 19807



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SECTION 02081
ASBESTOS ABATEMENT
PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. The Asbestos abatement contractor shall perform the following work as described below and indicated on the drawings. The drawings are only a diagrammatic representation of the Work Areas and do not constitute the actual quantities of material. Asbestos abatement contractor is responsible for the confirmation of the actual total quantities of the Work. The Asbestos Contractor shall provide all plant, labor, equipment and materials complete for performance of the Work in accordance with the Contract Documents. All asbestos material is to be disposed of as ACM waste. Quantities indicted below are confirmed asbestos.

DOBBS FERRY HIGH/MIDDLE SCHOOL

505 Broadway, Dobbs Ferry, NY

1. Drawing DMSHS001

a. Remove and dispose of asbestos-containing friable and non-friable interior and exterior building materials within **Work Areas 1-4** utilizing NYS DOL 12 NYCRR Part 56 7.11 for interior friable and interior non-friable removal, as well as NYS DOL 12 NYCRR Part 56 11.6 for Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS, or applicable variances.

Work Area #	Location	Asbestos-Containing Material	Approximate Quantity	Removal Procedure
1	Rooms 300A and 300B	Acoustical Ceiling Plaster, Scratch Coat Only	1,500 SF	NYS DOL 12 NYCRR Part 56 7.11 Full Containment*
2	Mechanical/Fan Room Third Floor	Tar on Brick	30 SF	NYS DOL 12 NYCRR Part 56 7.11 Negative Pressure Tent Removal

3	Ground Level Mechanical Room by Vent	Roofing Tar at Bottom	80 SF	NYS DOL 12 NYCRR Part 56 11.6 Exterior Project Removal of Non-friable ACM Roofing,
4	Upper "Green" Roof	Inaccessible Materials Under Capping	TBD**	Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Othe NOB ACMS

^{*} Quantity of material to be affected by scope of work to be determined. If less than or equal to 160 SF, Negative Pressure Tent Removal procedures may be followed.

- B. The Contractor is responsible for completing all notifications and variances required to meet the determined start date (if applicable).
- C. If asbestos containments are required, the Contractor shall establish the asbestos containments so as to not interfere with operation of or access to the temporary equipment that shall be installed by others.
- D. The Contractor shall field verify the amount of ACM and familiarize him/her-self with all variable field conditions in the building before the submission of his/her quote. The quantities presented in this specification are approximate only and should not be used solely as the basis for any quote. Any discrepancies or difference in the approximate and actual quantities shall be resolved before the award of any Contract. No change order relative to ACM material quantity will be permitted after the award of the Contract. In the event that suspect materials not included in this Specification are encountered while the work is in progress, such material shall be tested and, if confirmed ACM, removed as ACM, in accordance with the procedures contained herein. The discovery of any new material(s) should not delay the progress of the work as contained in this specification. Payment for any additional work will be considered on a case-bycase basis by the Environmental Consultant and Dobbs Ferry Union Free School District. It is the responsibility of the Contractor to determine and negotiate the full cost of any such payment prior to performance of any additional work.
- F. ACM shall be properly handled, packaged, and transported for disposal in a landfill in accordance with all Federal, State and Local regulations. After September 4, 2006, the Contractor shall follow Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York (Cited as 12 NYCRR Part 56) as amended effective March 21, 2007. All related manifests and shipping logs shall be provided to Dobbs Ferry Union Free School District upon or before the end of the project.

^{**} Materials assumed to exist

- G. All work shall be accomplished in strict adherence to the project Specification, applicable Federal, State, and Local Regulations. Whenever there is a conflict or overlap of the above references, the more stringent provision shall apply.
- H. The Contractor's industrial hygiene practices during asbestos abatement will be monitored by Dobbs Ferry Union Free School District Environmental Consultant. The Contractor shall be responsible for monitoring his/her own construction safety work practices for compliance with the OSHA regulations.
- I. The Asbestos Contractor shall provide the best available technology, and state-of-the-art procedures and methods of execution, clean-up, disposal, and safety.
- J. The Contractor will be required, if approved by Dobbs Ferry Union Free School District and/or its Representative, to obtain at his/her own expense appropriate variances from regulatory agencies as required to complete the safe removal of asbestos containing material as described in this specification.
- K. Dobbs Ferry Union Free School District environmental consultant will sample all suspect materials that may be identified during the course of demolition, if applicable. The Contractor shall provide access to the consultant to perform the testing and no additional costs will be paid for the time it takes to perform the testing. The contractor shall provide itemized cost proposal to Dobbs Ferry Union Free School District which must include separate costs for the abatement of the individual materials revealed to be ACM (if applicable). Additional asbestos-containing materials shall not be abated without written authorization from Dobbs Ferry Union Free School District or environmental consultant. The contractor will not be compensated for any additional materials that can be encountered during the abatement project, without prior written authorization from Dobbs Ferry Union Free School District or environmental consultant.
- 1.02 PHASING OF WORK: This work shall include asbestos abatement associated with upcoming interior, exterior and roof upgrades project. The Asbestos Contractor shall perform and complete the abatement of asbestos-containing materials during regular working hours, Monday through Friday between 8:00 am and 4:00 pm or as directed by the facility. It is the Contractor's responsibility to ensure that acceptable visual inspection and air monitoring results are obtained with fiber count of <70 Structures/mm2 of air using AHERA analysis method and are completed prior to the return of building occupants or other trades. All work shall be coordinated with Dobbs Ferry Union Free School District and Dobbs Ferry Union Free School District Environmental Consultant prior to start of any work. The Dobbs Ferry Union Free School District Environmental Consultant shall be present whenever any asbestos abatement work is being conducted.
- **1.03 AUTHORITY TO STOP WORK**: Dobbs Ferry Union Free School District and the Environmental Consultant shall have the authority to stop the abatement work at any time

the contractor's work is not in conformance with the Specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected to the satisfaction of Dobbs Ferry Union Free School District and the Environmental Consultant. Standby time to resolve the problems shall be at the contractor's expense.

1.04 SITE REQUIREMENTS:

- A. Noise Control: Provide mufflers or other acceptable means of noise reduction for all equipment to be used by the Contractor. Observe local laws regarding noise control.
- B. Wastewater: All water used by the Contractor during asbestos abatement activities shall be collected and passed through a water filtration system capable of filtering particles down to 5 microns prior to being discharged into the sanitary sewer. The Contractor shall contact the Westchester County engineering department to determine the acceptable location(s) to access the sanitary sewer. The Contractor shall be responsible for connection to the sanitary sewer, and for providing piping, pumps, water filtration systems, and other items necessary to collect, transport, filter, and dispose of the wastewater.
- C. Log In/Out: The Asbestos Contractor must ensure all workers log in and out daily at the site.
- D. The location of the Decontamination Unit shall be as per abatement design drawings. All variations must be coordinated and approved by the site manager and Dobbs Ferry Union Free School District Environmental Consultant.

1.05 HEALTH AND SAFETY:

- A. Toxic Effects: The Contractor shall assume all responsibility for any toxic effects to workers from the air supplied to respirators, or from toxic or damaging vapors or residues resulting from the use of encapsulant and/or wetting agents or other substances used by the Contractor during construction.
- B. Chemical/Biological Hazards: The known chemical/biological hazards on site include asbestos-containing material and debris. The Contractor shall provide materials, equipment and training to its workers to ensure their protection from these and any other chemical/biological hazards which may be identified during the course of this work.
- C. Physical Hazards: The Contractor shall provide safety equipment and training to his/her workers to ensure their protection from any physical hazards including but not limited to trip/fall hazards, working at elevation, heat stress, contact with energized (hot) active equipment, noise, overhead bump hazards, and electrical shock that may be present during the Work.

- D. Safety Act: The Occupational and Safety Health Act (OSHA) of 1970, as amended, shall be strictly complied with during the course of this project. This Act shall govern the conduct of the Contractor's workmen, tradesmen, materialmen, and subcontractors, and visitors to the project site.
- E. Accident Prevention: In order to protect the lives and health of his/her employees, the Contractor shall comply with all pertinent provisions of the latest edition of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc. and shall maintain an accurate record of all accidents which occur during the project. An injury or loss of life must be immediately reported by the Contractor to the Dobbs Ferry Union Free School District and/or its Representatives, and a copy of the Contractor's report to his/her insurer of an accident must be provided to the Dobbs Ferry Union Free School District and/or its Representatives.
- F. Emergency Response: The Contractor shall establish an Emergency Response Team made up of members of his/her work force. Team members shall be trained, organized, and capable of responding in the event of an accident, fire, or other emergency. The Contractor shall designate a site Safety Coordinator to train team members regarding the location and use of site-specific fire/life safety equipment. As a minimum requirement, members of the Emergency Response Team shall be knowledgeable in standard first aid and CPR techniques, fire extinguisher use, and evacuation procedures.
- G. Workmen Protection: The Contractor shall provide and maintain all safety measures necessary to properly protect workmen.
- H. Emergency Actions: In an emergency affecting the safety of life, the work, or adjoining property, the Contractor, to prevent such threatened loss or injury without special instruction or authorization from the Dobbs Ferry Union Free School District and/or its Representatives, is hereby permitted to act at his/her discretion.
- I. Hazard Communication Act: The Contractor shall comply with the Hazard Communication Standard promulgated by the Occupational Safety and Health Administration (OSHA No. 29 CFR 1910.1200). This program ensures that all employers provide the information they need to inform and train employees properly and to design and put in place employee protection program. It also provides necessary hazard information to employees so they can participate in, and support, the protective measures needed at their work place. The contractor shall ensure that labels or other forms of warning are legible in English. Employer having employees who speak other languages must add the information in their languages. See OSHA 29 CFR 1910.1200 for more details.

1.06 WORK SUPERVISION AND COORDINATION:

- A. Abatement Contractor's Supervisor: From the start of work through to the project completion the Contractor shall have on-site a responsible and competent supervisor who posses valid NYSDOL Supervisor certifications. As a minimum, the Asbestos Contractor's Supervisor shall meet the qualifications as required by Article 1.12, for a job supervisor. The Supervisor shall be on site during all working hours. When the Supervisor must leave site during work, a temporary Supervisor shall be appointed.
- B. Quality of Work: The Supervisor shall supervise, inspect and direct the Work competently and efficiently, devoting such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. The Supervisor shall be responsible to see that Work complies accurately with the Contract Documents, and that all Work installed is of good quality and workmanship.
- **1.07 SUBMITTALS:** Unless otherwise noted the Contractor shall submit three (3) copies of each APPLICABLE submittal to the Dobbs Ferry Union Free School District Environmental Consultant and its Representatives for review and/or approval. The Contractor shall provide the following:

A. Pre-Project Submittal:

- 1. Certificates of Insurance naming Dobbs Ferry Union Free School District as additional insured.
- 2. All required bonds. All bonds shall be underwritten by a United States based, preferably New York State, A or B rated bonding company.
- 3. List of Subcontractors.
- 4. Health and Safety Plan: Provide a written Health and Safety Plan addressing procedures for work place safety. As a minimum, the following topics shall be addressed in the plan:
 - a. Hazard Communication. Procedure on how physical and health hazards associated with the work are identified and communicated to employees, and name of the person responsible for implementation of the Hazard Communication Program.
 - b. Guidelines for assessment and prevention of heat stress.
 - c. Procedures for using ladders safely.
 - d. Electrical safety procedures.

- Emergency Action Plan: The Contractor shall submit for review a e. written Emergency Action Plan. This Plan shall outline the contingency actions to be performed for emergencies including fire, accident, power failure, supplied air system failure, breach of work area containment, unexpected asbestos contamination in the site area and on the adjoining grounds, or spilling of asbestos material being hauled to storage and/or disposal. This Plan shall identify the manner in which emergencies are announced, emergency escape procedures and routes, and procedures to account for all employees after evacuation. The Plan shall identify those persons responsible for fire/life safety duties including the Site Safety Coordinator, persons responsible for fire prevention equipment and the control of fuel source hazards, and the members of the Emergency Response Team (see Paragraph "Emergency Response" of this Section). This Plan shall be readily available for review by all workers.
- f. Fall Protection Plan: The Contractor shall submit for review a written Fall Protection Plan. This plan shall outline the actions to be performed to protect personnel when they are working at elevation. The plan shall detail specific fall protection devices to be utilized, training provided to personnel for same and training of designated competent person in charge of and responsible for the elevated work site.
- 4. Proof of written notifications required by Paragraph "Codes, Permits and Standards" of this Section. Proof that all required permits and variances have been obtained.
- 5. Proof of written notification to the local police department, fire department and Facility (include a copy of required by NYS DOL ICR 56 section 56-3.6a ten day notice) that asbestos abatement work is being conducted. As a minimum, the notification letter shall include the address of the Facility, dates work is to be performed, and drawings indicating the areas to undergo abatement.
- 6. Documentation of compliance with all requirements of paragraph "Requirements and Qualifications" of this Section. Submittal shall include:
 - a. Proof that the job supervisors, foremen, and asbestos abatement workers meet State certification and license requirements.
 - b. Proof of a current medical surveillance program for all Contractor's personnel to work on this project.

- c. Completed and notarized Certificate of Worker's Release for each asbestos abatement worker, workers of other trades, or supervisory personnel who enter the work area or otherwise contact ACM.
- 7. Proof of a respiratory protection program. Submit level of respiratory protection intended for each operation required by the project.
- 8. Proof of historic airborne fiber data. Submit airborne asbestos fiber monitoring data from an independent air monitoring firm to substantiate selection of respiratory protection proposed. Data shall include the following for each procedure required by the work: 1. date of measurement; 2. type of work task monitored; 3. methods used for sample collection and analysis, and; 4. number, duration and results of samples taken.
- 9. Proof that a landfill site has been located, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials have been made. Provide the name and location of the landfill, and waste transport company, if applicable.
- 10. Manufacturer's literature on all proposed job related equipment and products to be used on this project. Include Safety Data Sheets (SDS) for encapsulant, fire retardant plastics, mastic remover and other chemicals to be used on this project.
- 11. A detailed Asbestos Removal and Disposal Work Plan which describes all aspects of the work to be performed for this project. The Plan shall include the following:
 - a. A detailed description of the work area enclosure. Provide shop drawings (with dimensions and locations) of proposed decontamination facilities and work areas. These drawings shall indicate the following: 1) areas to be sealed off and work area boundaries; and 2) proposed layout and location of the decontamination enclosure systems. Include a detailed description of any modifications or changes to be made to the specified negative pressure work area enclosure.
 - b. Specimen of the daily log proposed for use. Minimally, the log should include the date(s) and time(s) when all personnel enter and leave the work area(s).
- B. During Work Submittal:

- 1. Schedule of Work Changes: Any changes in the Schedule of Work proposed by the Contractor shall be submitted for approval to Dobbs Ferry Union Free School District no later than seven days prior to the commencement date of the proposed change. A revised Schedule shall be submitted at the end of each week.
- 2. Notarized copy of payroll showing that prevailing wage rates have been paid shall be submitted to the Dobbs Ferry Union Free School District on a weekly basis. Contractor shall use DOL form for wage payment.
- 3. A "Request For Services" form shall be submitted at least 24 hours in advance of required air monitoring tests and inspections to be performed by the Dobbs Ferry Union Free School District Environmental Consultant.
- 4. Results of all air monitoring performed by the Contractor shall be posted within 24 hours for regular abatement project after collection for all workers to see. A copy of the results shall be given to the Dobbs Ferry Union Free School District Environmental Consultant at the same time.
- 5. A certified, signed, and completed copy of each "Waste Shipment Record" form used, and receipts from the landfill operator which acknowledge the Contractor's delivery(s) of material, shall be submitted to the Consultant and Engineer within thirty days following removal of ACM from building.
- 6. A copy of the bound log book.

C. Post Project Submittal:

- 1. A notarized "Release of Liens" in a form acceptable to the Dobbs Ferry Union Free School District. Use the standard AIA form. Such notarized release of all liens shall certify that all subcontractors, labor suppliers, etc., have been paid their pro rate share of all payments to date, that the contractor has no basis for further claim, and will not make further claim for payment in any account after the first payment is made to him.
- 2. Proof of payment of prevailing wage rate to direct employees and subcontractor.
- 3. Notarized copies of a daily log showing the date(s) and time(s) of entrance to and exit from the work area(s) for all persons.
- 4. Compilation in chronological order of all air monitoring records pertaining to this project.
- 5. Compilation of all completed and signed Waste Shipment Record forms, bills of lading, or disposal receipts pertaining to this project.

- 6. Copies of notifications and checks to applicable agencies (see Subparagraph "Pre-Project Submittal Information" of this Section) that the asbestos abatement project has been completed.
- 7. Contractor shall submit the following items as part of his final submittals: Paid invoice verifications for sub-contractor (for Time and Material job), service contract agreement, insurance certificates, copies of the workers licenses (NYSDOL), and other submittal required for the Specification.
- **1.08 FIRE PROTECTION AND EMERGENCY EGRESS:** The Contractor shall be responsible to the security and safeguarding of all areas turned over by the facility to the Contractor. The Contractor shall designate to his/her workers and other building occupants a means of egress in case of emergency.
 - A. The Contractor shall establish emergency and fire exits from the work area. First aid kit, 2 full sets of protective clothing and respirators shall be provided for use by qualified emergency personnel in the clean room of the decontamination facility.
 - B. For full containment only, the Contractor shall provide a secure work area to protect against unauthorized entry into and around the work area. Any hazardous conditions shall be reported to the contractor's Supervisor and the contractor shall correct the hazard immediately. Any intrusion or incident shall be documented in a bound log book which shall be maintained at the project site.

1.09 CLEAN-UP:

- A. Asbestos Related Clean-up: All clean-up work related to asbestos abatement work shall be in strict accordance with general technical requirements and this specification.
- B. Final Site Cleaning: Upon completion of the work, the Contractor shall remove all temporary construction, decontamination facilities, and unused materials placed on site by the Contractor; put the premises in a neat and clean condition; and provide all sweeping, cleaning, and washing required to restore the site to its original condition.

1.10 CODES, PERMITS, AND STANDARDS:

A. The Contractor shall be solely responsible for compliance with all applicable federal, state (12 NYCRR Part 56 Adopted March 21, 2007), and local laws, ordinances, codes, rules, and regulations which govern asbestos abatement work or hauling and disposal of asbestos waste material. The current issue of each document shall govern. All work shall comply with all applicable codes and regulations as amended including: EPA Title 40CFR, Part 763, OSHA Title

- 29CFR, part 1910(including sections 1001,134,1926.2 and 1926.1200); EPA Title 40 CRF Part 61; NYSDEC Title 6,Part 364 and NYSDOH Title 10,Part 73
- B. Before starting the work, the Contractor shall examine the Technical Specification for compliance with codes and regulations applicable to the work and shall immediately report any discrepancy to the Dobbs Ferry Union Free School District Environmental Consultant.
- C. Where conflict among requirements or with these Specifications exists, the more stringent requirements shall apply.
- D. Permits, State Licenses, and Notifications: The Contractor shall be responsible for obtaining necessary permits, variances, state licenses, and certifications of personnel in conjunction with asbestos removal, hauling, and disposition and shall provide timely notification of such actions as may be required by federal, state, regional, and local authorities. Fees and/or charges for these licenses, permits, and notifications shall be paid by the Contractor. Contractor shall use all notification forms where applicable.
 - 1. Agency Notification: At least 10 days prior to commencement of any asbestos removal, the Contractor shall prepare written notification to EPA Region 2, to the New York State Department of Labor (NYSDOL), and all other applicable agencies having jurisdiction. In addition, the Contractor shall be required to obtain any other permits for work covered under this specification including permits required for air sampling.
- **1.11 TERMINOLOGY:** The following commonly-used terms are defined in the context of these Specifications:
 - Asbestos Project: Work that involves the removal, encapsulation, enclosure, repair or disturbance of friable or non-friable asbestos, or any handling of asbestos material that may result in the release of asbestos fibers. For the purpose of compliance with this Part, an asbestos project shall include any disturbance of asbestos fibers, and the planning, asbestos survey (as per Subpart 56-5.1), design, background air sampling, inspection, air sampling and oversight of abatement work, cleanup, and the handling of all asbestos material subject to abatement, as well as the supervising of such activities. Installation of friable ACM shall also be considered an asbestos project. An asbestos project starts with Phase I when the planning, asbestos survey, and design work begins or is required to begin. The project shall not be considered completed until Phase II D is complete.
 - B. Asbestos-Containing Material (ACM): Any material or product which contains more than 1 percent asbestos.

- C. Aggressive Air Sampling: Air monitoring samples collected while a leaf blower, fans, or other such devices are used to generate air turbulence within the work area.
- D. Air Filtration Device (AFD) A portable local exhaust system equipped with HEPA filtration, capable of maintaining a constant low velocity air flow into contaminated areas from adjacent, uncontaminated areas and capable of maintaining a negative air pressure with respect to the adjacent, uncontaminated areas.
- E. Air Lock: A system for permitting ingress or egress to the work area while permitting minimal air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways placed a minimum of three feet apart.
- F. Air Monitoring: The process of measuring the fiber content of a specific volume of air in a stated period of time. Personal air sampling results shall be calculated to reflect the employee's eight-hour time weighted average (TWA) exposure. Area sampling results are reported directly, without calculating the TWA.
- G. Amended Water: Water to which a surfactant has been added.
- H. Asbestos Removal Encapsulant: A chemical solution used in place of amended water during asbestos removal to penetrate, bind, and encapsulate the asbestos-containing material.
- I. Authorized Visitor: Dobbs Ferry Union Free School District Environmental Consultant or representatives of any regulatory or other agency having jurisdiction over the project.
- J. Dobbs Ferry Union Free School District Environmental Consultant: Dobbs Ferry Union Free School District agent who is authorized to exercise general contract administration and industrial hygiene inspection of the work.
- K. Certified Industrial Hygienist (CIH): One certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.
- L. Class II asbestos work: Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Class I asbestos work includes the removal of thermal system or surfacing materials.
- M. Competent Person: Definition and responsibilities as set down in 29 CFR 1926.1101(b) and as outlined herein.

- N. Curtained Doorway: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- O. Decontamination Enclosure System: A series of connected rooms for the decontamination of workers (a Personnel Decontamination Enclosure System) or of materials and equipment (Equipment Decontamination Enclosure System).
- P. Equipment Decontamination Enclosure System: A decontamination system for waste materials and equipment, typically consisting of a designated area of the work area, a washroom, and a holding area, with an air lock between any two adjacent rooms and a curtained doorway between the holding area and the non-work area. Not to be used for personnel entry/exit.
- Q. Encapsulant (Sealant): A liquid material which can be applied to ACM and which controls the possible release of asbestos fibers from the material, either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).
- R. Encapsulation: Application of an encapsulant to asbestos-containing building materials to control the possible release of asbestos fibers into the ambient air.
- S. Enclosure: Procedures necessary to completely enclose ACM behind air-tight, impermeable, permanent barriers.
- T. Excursion Limit (EL): The EL is an airborne concentration of asbestos to which no employee shall be exposed when not using respiratory protection. The EL is 1.0 f/cc as averaged over a 30 minute period.
- U. Fixed Object: A unit of equipment or furniture in the work area which cannot be removed from the work area.
- V. Friable: Any material which, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure, or is capable of being released into the air by hand pressure.
- W. Full Facepiece High Efficiency Respirator (FFHER): A respirator which covers the wearer's entire face from the hairline to below the chin and which is equipped with a HEPA filter.
- X. Half Mask High Efficiency Respirator (HMHER): A respirator which covers one-half of the wearer's face, from the bridge of the nose to below the chin, and is equipped with HEPA filters.
- Y. HEPA Filter: A high efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97 percent of the fibers of 0.3 micrometer or larger in diameter.

- Z. HEPA Vacuum Equipment: High efficiency particulate air (HEPA) filtered vacuuming equipment having a UL 586 filter system capable of collecting and retaining asbestos fibers.
- AA. Large Asbestos Project: Large asbestos project shall mean an asbestos project involving the disturbance, enclosure, encapsulation, repair or handling of 160 square feet or more of ACM, PACM or asbestos material or 260 linear feet or more of ACM, PACM or asbestos material.
- AB. Lockdown: Procedure of applying an encapsulant as a protective coating or sealant to a surface from which ACM has been removed in order to control and minimize airborne asbestos fiber generation that might result from residual asbestos-containing debris.
- AC. Minor Asbestos Project: Minor project shall mean an asbestos project involving the disturbance, enclosure, encapsulation, repair or handling of 10 square feet or less of ACM, PACM or asbestos material or 25 linear feet or less of ACM, PACM or asbestos material.
- AD. Movable Object: A unit of equipment or furniture which can be removed from the work area.
- AE. Plasticize: To cover floors and walls with plastic sheeting as herein specified.
- AF. Permissible Exposure Limit (PEL): The PEL is an airborne concentration of ACM to which no employee shall be exposed when not using respiratory protection. The OSHA PEL is 0.1 f/cc expressed on an 8-hour time weighted average (TWA).
- AG. Personnel Decontamination Enclosure System: A decontamination system for personnel and limited equipment, typically consisting of an equipment room, shower room, and clean room, with an air lock between any two adjacent rooms, and a curtained doorway between the equipment room and the work area, and a curtained doorway between the clean room and the non-work area. The decontamination system serves as the only entrance/exit for the work area.
- AH. Powered Air Purifying Respirator (PAPR): Either a full face-piece, helmet, or hooded respirator that powers breathing air to the wearer after the air has been purified through a HEPA filter.

- AI. Regulated Abatement Work Area: The portion of the restricted area where abatement work actually occurs. For tent work areas, the interior of each tent is a regulated abatement work area. For OSHA Class I and Class II asbestos abatement, the interior of the restricted area containment enclosure is the regulated abatement work area. For exterior non-friable asbestos abatement conducted without the establishment of negative air ventilation systems or containment enclosures, the entire restricted area surrounding the abatement location is considered to be the regulated abatement work area.
- AJ. Removal: The act of removing and transporting asbestos-containing or asbestos-contaminated materials from the work area to a suitable disposal site.
- AK. Small Asbestos Project: Small asbestos project shall mean an asbestos project involving the removal, disturbance, repair, encapsulation enclosure or handling of more than 10 and less than 160 square feet of ACM, PACM or asbestos material or more than 25 and less than 260 linear feet of ACM, PACM or asbestos material.
- AL. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
- AM Tent Procedure: A fire retardant polyethylene enclosure that includes walls, ceiling and a floor as required to remove ACM, PACM or asbestos material.
- AN. Type C Respirator: A respirator which supplies air to the wearer from a source outside the work area by means of a compressor.
- AO. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water or asbestos removal encapsulant and by afterwards disposing of these cleaning tools as asbestos-contaminated waste.
- AP. Work Area: Designated rooms, spaces, or areas of the project where asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area has been sealed, plasticized, and equipped with an airlock entrance or a decontamination enclosure system. A non-contained work area is an isolated or controlled-access area which has not been plasticized.

1.12 **REQUIREMENTS AND QUALIFICATIONS:**

A. Minimum Experience: The Contractor shall have experience with abatement work, as evidenced through participation in at least *two* asbestos abatement projects of complexity comparable to this project.

- B. Experience and Training: The Contractor's job supervisors, foremen, and workers shall be adequately trained and knowledgeable in the field of asbestos abatement. All personnel engaged in asbestos abatement or related activities shall have New York State DOL certifications. All phases of the work shall be executed by skilled craftsmen experienced in each respective trade. Proof of such experience shall be submitted upon request by the Dobbs Ferry Union Free School District. Improperly trained, untrained, or inexperienced personnel shall not be allowed in the work area(s). Personnel shall meet minimum training and experience requirements outlined in this Section.
 - 1. The Contractor's on-site job supervisor shall have successfully completed, within the last twelve months, the NYSDOH-approved course "Supervision of Asbestos Abatement Projects", and shall be qualified as a NYSDOL-certified Contractor/Supervisor. Course must be provided by an NYSDOH-approved training provider. The supervisor shall have experience with abatement work, as evidenced through participation in at least two asbestos abatement projects of complexity comparable to this project.
 - 2. The job supervisors and foremen shall be thoroughly familiar with and experienced in asbestos removal and related work and shall meet the requirements of a competent person set down in OSHA Standard 29 CFR 1926.1101.
 - 3. All asbestos abatement workers shall be knowledgeable, qualified, and trained in the removal, handling, and disposal of asbestos material and in subsequent cleaning of the affected environment. All asbestos abatement workers shall be certified as having attended and satisfactorily completed asbestos worker training in accordance with OSHA Standard 29 CFR 1926.1101(k)(3). Course must be provided by an NYSDOH-approved training provider.
 - 4. The Contractor's job supervisors, foremen, and asbestos abatement workers shall be certified and licensed as required by the NYSDOL.
 - 5. Prior to commencement of work, all personnel who are to enter the work area shall be instructed in and shall be knowledgeable of the appropriate procedures for personnel protection and asbestos abatement. On-site training in the use of equipment and facilities unique to this job site shall be performed. Emergency evacuation procedures from the work area shall also be included in worker training.
- C. Supervision Requirements: The Contractor shall provide adequate job supervision for all phases of the asbestos abatement work.

- 1. The Contractor shall have a NYSDOL job supervisor present on site whenever work described in this Section is in progress. If the job supervisor leaves the site for any reason a qualified and certified supervisor, who meets the requirements of this Section and is familiar with the current status of the work, shall be designated. Dobbs Ferry Union Free School District Designated Representative shall be informed of the substitution. The supervisor must be familiar and experienced with asbestos removal and its related work, safety procedures, and equipment.
- D. Worker Medical Examinations: The Contractor shall provide medical examinations for all employees engaged in asbestos removal and disposal operations, in accordance with OSHA Standards 29 CFR 1910.134(b), 1926.1101, and applicable state regulations. The Contractor shall ensure that all employee examination results are on file in his office and available for review and are maintained in accordance with OSHA Standard 29 CFR 1926.1101 (n) (3).
- E. Certificate of Worker's Release: Each asbestos abatement worker, workers of other trades, or any supervisory personnel who enter the work area, or otherwise contact ACM, shall submit a Certificate of Worker's Release, as required in the Section "Submittal".

1.13 TESTING AND INSPECTION REQUIREMENTS AND RESPONSIBILITIES:

Visual inspections and air monitoring will be performed before, during, and after asbestos abatement (as required, based on removal method(s) being used) to document airborne asbestos fiber concentrations as defined in this specification.

- A. Dobbs Ferry Union Free School District Responsibilities:
 - 1. Dobbs Ferry Union Free School District will employ an Environmental Consultant to perform Project Monitoring and air testing. The project monitor will have the authority to approve the contractor's work, stop the contractor's work and direct the contractor to take corrective actions where required.
 - 2. Area air samples will be collected and analyzed using NIOSH Method 7400. Air samples will be collected during each shift as required by the regulations.
 - 3. Clearance testing by Transmission electron microscopy (TEM) will be conducted as per AHERA regulations. Air samples will be collected to demonstrate final re-occupancy clearance for work areas within the building. The fiber concentration must comply with the specified clearance level as per AHERA and this specification. Dobbs Ferry Union Free School District will provide for collection and analysis of one round of samples required to demonstrate clearance in each discrete work area.

4. Dobbs Ferry Union Free School District Environmental Consultant will perform inspections of the work area, as specified, upon request of the Contractor.

B. Contractor's Responsibilities:

- 1. TEM air samples which fail to meet the re-occupancy clearance standard shall be paid for by the Contractor. Should a delay occur, due to failure(s) of clearance air testing, all associated expenses such as TEM analysis, and the Environmental Consultant's time for additional cleaning and air testing, shall be paid by the asbestos contractor. If results of the inside work area group of air samples are unsatisfactory, recleaning of regulated abatement work area surfaces using wet methods, followed by another drying time period and then collection and analysis of an additional set (both inside and outside work area samples) of clearance air samples is required. If only the results of the outside work area group of air samples is unsatisfactory, clean-up of surfaces outside of the regulated abatement work area using HEPA-vacuums and wet-cleaning methods shall be performed prior to collection and analysis of an additional group of outside work area clearance air samples as required by ICR 56 Section 56-9.2. This recleaning/clean-up and sampling process shall be repeated until satisfactory clearance air sampling results have been achieved for all asbestos project non-exempt regulated abatement work areas throughout the entire work site.
- 2. The Contractor, at his/her expense, shall provide OSHA monitoring and all other all tests required by specified applicable regulations, codes, and standards and any other tests for his/her use. The use of a testing laboratory by Dobbs Ferry Union Free School District does not release the Contractor from providing tests required for the protection and safety of his/her employees.
- 3. The Contractor shall employ an independent testing laboratory for analysis of OSHA personal air monitoring samples. The laboratory used for air sample analysis shall be successfully participating in the "Proficiency Analytical Testing (PAT) Program for Laboratory Quality Control for Asbestos." The monitoring shall be supervised by an Industrial Hygienist certified by the American Board of Industrial Hygiene (A.B.I.H.). Each laboratory **ELAP** (Environmental shall be Laboratory Accreditation Program) and NVLAP (National Voluntary Laboratory Accreditation Program) certified. Dobbs Ferry Union Free School District shall approve the contractor's testing laboratory.
- 4. From each work area the Contractor, at his/her expense, shall collect and analyze OSHA personal air monitoring samples. Sampling shall be repeated during each different work activity. Sample collection and

- analysis shall be performed using the OSHA Reference Method as outlined in 29 CFR 1926.1101, Appendix A.
- 5. Results of all air monitoring performed by the Contractor shall be posted within 24 hours for regular abatement project after collection for all workers to see. A copy of the results shall be given to the Dobbs Ferry Union Free School District Environmental Consultant at the same time.
- 5. The Contractor shall be advised whenever questions arise concerning compliance with standards of quality and completeness of the work, and shall use his/her best efforts to resolve any such questions to the satisfaction of the Dobbs Ferry Union Free School District Environmental Consultant.
- 6. Where air monitoring tests and/or inspections are specified, the Contractor shall notify Dobbs Ferry Union Free School District Environmental Consultant, in writing, 24 hours, in advance of the required test and/or inspection.
- 8. The Contractor is responsible for ensuring the Work is complete to the level that meets the criteria of the inspection. The Contractor shall perform an inspection of the Work to evaluate completeness prior to requesting an inspection by the W Dobbs Ferry Union Free School District Environmental Consultant.
- C. Time Requirements for Dobbs Ferry Union Free School District Environmental Consultant's Inspections and Testing: Where visual inspections or air testing is required to be performed by the Dobbs Ferry Union Free School District Environmental Consultant, the Contractor shall allow for the following response/analytical time for completion of the inspection/test.
 - 1. Where visual inspections are required, allow 24 hours, beginning from the time the Contractor's request is received by the Dobbs Ferry Union Free School District Environmental Consultant, for the performance of the inspection.
 - 2. Where TEM clearance air monitoring tests are required, allow 24 hours, beginning from the time the Contractor's written request is received by the Dobbs Ferry Union Free School District Environmental Consultant, to the beginning of the air test.

PART 2 - PRODUCTS

2.01 MATERIALS: Materials provided under this section shall be standard products of manufacturers regularly engaged in the production of the items and shall conform to OSHA Standard 29 CFR 1926.1101; EPA Standard 40 CFR 61, Subpart M; Department

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of Transportation Standards 49 CFR 171, 172, and 173; applicable state regulations; and requirements specified herein. Materials listed under this section "or equal" shall be provided for work under contract.

- A. Plastic: Provide fire retardant plastic of 6-mil thickness shall be provided in rolls of sizes which will minimize the frequency of joints. Fire retardant plastic sheet shall be used for plasticizing the enclosed work area, for preparation of the decontamination enclosure system, and for waste packaging.
- B. Reinforced Fire Retardant Plastic: Provide reinforced polyethylene sheet for the floor area of the decontamination enclosure system. Reinforced plastic sheet provided for this project shall be a 19 mil, 3-ply, high density flame resistant-reinforced-polyethylene sheet. Plastic color shall be opaque.
- C. Duct Tape: Duct tape shall be capable of sealing joints of adjacent sheets of plastic and of attaching plastic sheeting to finished surfaces without damage to existing finish and shall be capable of adhering under both dry and wet conditions, including use of amended water
- D. Surfactant: Surfactant (Wetting Agent) shall consist of resin materials in a water base, which have been tested to ensure materials are non-toxic and non-hazardous. Surfactants shall be installed according to the manufacturer's written instructions.
- E. Lockdown Encapsulants: Encapsulants used after asbestos removal to lockdown fugitive fibers shall carry a Class "A" fire resistance rating and shall have an ASTM E-162 flame spread index of 15 or less. A tint shall be given to the encapsulant by means of the addition of non-toxic, nonflammable colorings before application. The encapsulant shall be installed according to the manufacturer's written instructions.
- F. Caulking Sealant: Caulking sealant shall be single component, non-sag elastomer with 1600% elongation capacity. Sealant shall meet the requirements of Federal Specification TT-S-00230C, Class A Type II. Sealant shall be used to form an airtight seal around plywood barriers or temporary partitions, to seal along the seams of the decontamination enclosure system's plywood sheathing, and to seal around piping or other small penetrations of the work area. Sealant application shall be according to the manufactures written instructions.

- G. Foam Sealant: Foam Sealant shall be expanding urethane Class 1 foam sealant with an Underwriters Laboratories, Inc. (U.L. 723) flame spread index of 25 or less, smoke developed index of 0, and a minimum operating temperature range between -30°F and 250°F.
- H. Plywood: Plywood used for temporary partitions, decontamination enclosure systems, and tunnels shall be an exterior grade and a minimum 3/8-inch thick.
- I. Spray Adhesive: Spray Aerosol Adhesive shall be specially formulated to stick to sheet polyethylene (3M 76, 3M 77, or equivalent).
- J. Other Materials: All other materials, such as lumber, plywood, tools, scrapers, brushes, cleaning materials, adhesive, nails, hardware, etc., which are required to perform the work described in this Section shall be provided. Materials and equipment shall be new or used, uncontaminated by asbestos, in serviceable condition, and appropriate for the intended purpose.
- K. Disposal Bags: Plastic Disposal Bags shall be a minimum of six mils in thickness. Bags shall be labeled in accordance with this Section.
- L. Shipping Containers: Impermeable Containers shall be suitable to receive and retain any asbestos-containing or asbestos-contaminated materials until they are disposed of at an approved landfill. The containers shall be labeled in accordance with this Section. Containers shall be both airtight and watertight and conform to DOT Standard 49 CFR 178.224. Each container shall be constructed of fiber, hard plastic, or metal, with locking, airtight lids.
- M. Markings and Labels: Disposal bags and shipping containers shall bear danger labels, transportation packaging labels, and generator identification information. Labels shall be permanently affixed to all bags and shipping containers containing ACM, in accordance with OSHA Standard 29 CFR 1926.1101(k)(2), DOT Standard 49 CFR Part 171 and 172, and EPA Standard 40 CFR Part 61.150(a)(1)(v).
 - 1. Danger label format and color shall conform to OSHA Standard 29 CFR 1926.200. Danger labels shall display the following legend/information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG
DISEASE HAZARD

- 2. DOT Marking and Labels: Markings and labels shall be permanently affixed to all bags and containers containing ACM, in accordance with DOT 49 CFR 172.304 and 172.407.
 - a. Markings shall display the following text:

RQ, ASBESTOS, NA 2212

- b. Labels shall be diamond shape and shall be located near the Marking text. Labels will consist of a diamond a minimum of 100 millimeters (mm) on each side with each side having a solid line inner boarder 5.0 to 6.3 mm from the edge. The label shall be white with seven black vertical stripes on the top half. Black stripes and white spaces shall be equally spaced. The lower half of the label shall be white with the class number "9" underlined and centered at the bottom. Refer to DOT 40 172.446 for label format.
- 3. Generator identification information shall be affixed to each DOT label format and color shall conform to DOT Standard 49 CFR 172.304. Generator identification information labels shall display the following legend/information:

GENERATOR'S NAME GENERATOR'S 24 HOUR PHONE GENERATOR'S FACILITY ADDRESS

N. Reuse of Containers: If impermeable containers used to transport bagged asbestos waste to the landfill are to be reused, the empty containers shall display the following label:

RESIDUE: LAST CONTAINED ASBESTOS RQ

O. Warning Signs: Warning Signs shall be posted at the perimeter of the work area prior to abatement operations in accordance with OSHA Standard 29 CFR 1926.1101. Danger sign format and color shall conform to OSHA Standard 29 CFR 1926.200. The signs shall display the legend indicated below:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN THIS AREA

- P. Mastic remover. The contractor shall use an odorless mastic remover. Manufacture and brand of mastic remover shall be approved by the Facility prior to commencing removal work.
- **EQUIPMENT:** Equipment provided under this section shall conform to applicable federal and state regulations, local codes, and the requirements specified herein.
 - A. Spraying Equipment: Equipment used to apply amended water or removal encapsulant shall be of a low pressure type to prevent disturbance of the asbestos prior to physical controlled removal. Airless spray equipment shall be provided for the application of asbestos encapsulant.
 - B. Vehicles: Trucks or Vans used for the transportation of asbestos waste shall be enclosed and suitable for loading, temporary storage, transit, and unloading of asbestos-contaminated waste without exposure to persons or property.
 - C. Fall Protection Equipment: Certified and approved equipment to be used by trained personnel when working at elevation to protect against falling from an elevated work area.
 - D. Fire Extinguisher: Type "ABC" dry chemical extinguisher or a combination of several extinguisher of NFPA recommended types for the fire hazard exposures in each extinguisher location shall be provided. Minimum size of extinguisher shall be 4-A, and 40-B:C. Supply a minimum of one extinguisher for every 1,000 square feet of floor area, with a maximum travel distance to an extinguisher of 75-feet. Supply at least one extinguisher in each decontamination enclosure equipment room, and clean room. Supply 2 additional extinguishers inside the work area
 - E. Smoke Detectors: Smoke detectors of the battery powered ionization type will be required at a rate of one per 5,000 square feet, with a minimum of one smoke detector in the decontamination enclosure clean room, and one in the work area.
 - F. Water Filtration System: A system capable of filtering and retaining particles larger than 5.0 microns in size shall be provided.
 - G. Carts: Provide water tight wheeled carts with tight fitting lids suitable for movement of non-contaminated waste or bagged asbestos waste from the decontamination enclosure system to the waste storage container or transport vehicle.
 - H. Power Tools: Provide power tools necessary to complete the Work. Power tools used directly for asbestos removal shall be equipped with a dust collection system. Attach a shroud connected to a HEPA vacuum system for capture of dust.

- **2.03 WORKER PROTECTIVE CLOTHING AND EQUIPMENT:** Protective clothing and equipment shall conform to OSHA Standard 29 CFR 1926.1101
 - A. Protective Clothing: Workers shall be provided with sufficient sets of properly fitting, full-body, disposable coveralls, head covers, gloves, and 18-inch high boot-type foot covers. Disposable coveralls, head covers, and 18-inch high boot-type foot covers shall be constructed of material equal to DuPont "TYVEK-Type 14" or Kimberly-Clark "Kleenguard", as a minimum requirement.
 - 1. The Contractor shall provide authorized visitors and the Dobbs Ferry Union Free School District Environmental Consultant suitable properly fitting protective disposable clothing, headgear, hard hats, eye protection, respiratory protection, and footwear (up to four sets per 8-hour shift) whenever they are required to enter the work area.
 - B. Equipment: Eye protection and hard hats required for job conditions or by applicable safety regulations shall be provided.
 - C. Respiratory Protection: The Contractor shall be solely responsible for providing adequate respiratory protection at all times for all individuals in the work area. Types of respirators used shall be approved by MSHA/NIOSH for asbestos in accordance with OSHA Standard 29 CFR 1926.1101 and 29 CFR 1910.134. The Contractor shall provide a level of respiratory protection which supplies an airborne fiber level inside the respirator below 0.01 fibers per cubic centimeter (f/cc), as the minimum level of protection allowed. Determine the proper level of protection by dividing the actual airborne fiber count in the work area by the "protection factors" given below for each respirator type:

Respirator Type	<u>Protection Factor</u>
Air purifying: Negative-pressure respirator, High efficiency HEPA filter, Half-facepiece	10
Air purifying: Negative-pressure respirator, High efficiency HEPA filter, Full-Facepiece	50 (quantitative)
Powered air purifying (PAPR): Positive pressure respirator High efficiency HEPA filter, Full-facepiece	1000
Type C supplied air:	1000

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Positive-pressure respirator, Pressure-demand, Full-facepiece HEPA escape

Type C supplied air: 1000
Positive-pressure respirator,
Pressure-demand,
Full-facepiece
HEPA escape

Type C supplied air: 1000
Pressure-demand,
Full-facepiece
equipped with an auxiliary SCBA

- 1. The Contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the work area(s), as specified in OSHA Standard 29 CFR 1926.1101, and as more stringently specified otherwise, herein.
- 2. During the use of supplied air systems the Contractor shall provide authorized visitors, Dobbs Ferry Union Free School District Environmental Consultant, and the testing laboratory representative with individually issued and marked respiratory equipment (up to six units). Respiratory equipment shall be compatible with the supplied air system in use, and shall be suitable for the asbestos exposure level(s) in the work area(s), as specified in OSHA Standard 29 CFR 1926.1101, and as more stringently specified otherwise, herein.
- 3. Where respirators with disposable filter parts are employed, the Contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation.
- 4. Breathing air supply systems shall conform to the USEPA NIOSH Document EPA-560-OPTS-86-001 (September 1986) entitled "A Guide to Respiratory Protection for the Asbestos Abatement Industry."
- 5. The Contractor shall have a minimum of two spare air hoses with connectors to permit the Dobbs Ferry Union Free School District Environmental Consultant or testing laboratory's representative to connect his/her assigned Type C respirator to the air system at <u>any time</u> without having to wait for personnel to exit the work area in order to obtain a spare hose.

PART 3 - EXECUTION

3.01 <u>DECONTAMINATION ENCLOSURE SYSTEMS</u>:

- A. Personal decontamination system enclosures shall be constructed and functional prior to commencing the regulated abatement work area preparation activities. Waste decontamination system enclosures shall be constructed and functional at the completion of preparation activities. After installation of the personal decontamination system enclosure, all access to the regulated abatement work area shall be via the installed personal decontamination system enclosure.
- B. Personal Decontamination System Enclosure Large Project.
 - Enclosure General. A personal decontamination system enclosure shall 1. be provided outside the regulated abatement work area and in close proximity to all locations where personnel shall enter or exit the regulated abatement work area. One personal decontamination enclosure system for each regulated abatement work area shall be required. This system may adequate existing lighting sources separate from decontamination system enclosure, or shall be supplied with a GFCI protected temporary lighting system. The personal decontamination system enclosure shall be sized to accommodate the number of workers and equipment required for the intended purpose. Such system may consist of existing attached rooms outside of the regulated abatement work area, if the layout is appropriate, that can be plasticized and are accessible from the regulated abatement work area. When this situation does not exist, personal decontamination enclosure systems may be constructed of metal, wood or plastic supports covered with fire-retardant plastic sheeting. A minimum of one (1) layer of six (6) mil fire-retardant plastic sheeting shall be installed on the ceiling, and walls of the enclosure system. At least two (2) layers of six (6) mil fire-retardant reinforced plastic sheeting shall be used for flooring protection of this area. This system must be kept clean, sanitary and climate controlled at all times in conformance with all federal, state and local government requirements. This system shall remain on-site, operational and be used until completion of Phase II C of the asbestos project.
 - 2. Rooms and Configuration. The personal decontamination system enclosure shall consist of a clean room, a shower room and an equipment room connected in series but separated from each other by airlocks. There shall be a curtained doorway separation between the equipment room and the regulated abatement work area, and there shall be a lockable door to the outside. (See Figure 1 within ICR 56) Minimum dimensions for each airlock, shower room and equipment room shall be three (3) feet wide by six (6) feet in height, to allow for adequate access to and from the regulated abatement work area.

- 3. Curtained Doorway. An assembly which consists of at least three (3) overlapping sheets of six (6) mil fire retardant plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to insure that the sheets hang straight and maintain a seal over the doorway when not in use.
- 4. Framing. Enclosures systems accessible to the public shall be fully framed, hard-wall sheathed and utilize a lockable door for safety and security.
- 5. Sheathing. A plywood or oriented strand board (OSB) sheathing material of at least 3/8-inch thickness.
- 6. Plastic Sheeting. Enclosure systems constructed at the work site shall use at least one (1) layer of six (6) mil fire-retardant plastic sheeting on walls and ceiling. At least two (2) layers of six (6) mil fire-retardant reinforced plastic sheeting shall be used for floor protection of this area.
- 7. Prefabricated or Trailer Units. A completely watertight fiberglass or marine painted prefabricated unit does not require plasticizing. Rooms shall be configured as per paragraph (2) of this Section. All prefabricated or trailer decontamination units shall be kept in good condition, and shall be completely decontaminated after final cleaning and immediately prior to clearance air sampling. Upon receiving satisfactory clearance air results, the prefabricated units shall be sealed then separated from the regulated abatement work area and removed from the site.
- 8. Clean Room. The clean room shall be sized to accommodate a full workshift of asbestos abatement contractor personnel, as well as the air sampling technician and the project monitor. The clean room shall be a minimum of six (6) feet in height. A minimum of thirty-two (32) square feet of floor space shall be provided for every six (6) full shift abatement workers, calculated on the basis of the largest work shift. If the largest work shift consists of three (3) or less full shift abatement workers, the minimum clean room size requirement is reduced to twenty-four (24) square feet of floor space. Benches, lockers and hooks shall be provided for street clothes. Shelves for storing respirators shall be provided. Clean clothing, replacement filters for respirators, towels and other necessary items shall be provided. The clean room shall not be used for storage of tools, equipment or materials. It shall not be used for office space. A lockable door shall be provided to permit access to the clean room from outside the regulated abatement work area or enclosure and shall be used to secure the regulated abatement work area and decontamination enclosure during non-work hours.
- 9. Shower Room. The shower room shall contain one (1) shower per every six (6) full shift abatement workers, calculated on the basis of the largest work shift. Multiple showers shall be simultaneously accessible (installed in parallel) to certified personnel. Each showerhead shall be supplied with hot and cold water adjustable at the tap. The shower enclosure shall be

constructed to ensure against leakage of any kind. Uncontaminated soap, shampoo and towels shall be available at all times. Shower water shall be drained, collected and filtered through a system with at least 5.0-micron particle size collection capability. Submersible pumps shall be installed, maintained and utilized in accordance with pertinent OSHA regulations and manufacturer's recommendations. A multi-stage filtering system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filtering system by larger particles. Filtered wastewater shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestoscontaminated waste.

- 10. Equipment Room. The equipment room shall be used for the storage of decontaminated equipment and tools. A one (1) day supply of replacement filters for HEPA-vacuums and negative pressure ventilation equipment in sealed containers, extra tools, containers of surfactant and other materials and equipment that may be required during the abatement project may also be stored here. A container lined with a labeled, at least six (6) mil plastic bag for collection of clothing shall be located in this room. Contaminated footwear and work clothes shall be stored in this area.
- 11. Airlocks. Airlock construction shall consist of two (2) curtained doorways with three (3) alternating six (6) mil fire retardant polyethylene curtains per doorway, separated by a distance of at least three (3) feet, such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the next doorway. Minimum airlock size shall be three (3) feet wide, by three (3) feet long, by six (6) feet in height.

C. Personal Decontamination System Enclosure - Small Project

- 1. Enclosure Requirements. A personal decontamination system enclosure for a Small asbestos project shall consist of, at a minimum, an equipment room, a shower room and a clean room separated from each other and from the regulated abatement work area and other areas by curtained doorways as defined in ICR 56 Section 56-2.1. All other provisions for personal decontamination system for a Large asbestos project shall apply. Equipment storage, personal gross decontamination and removal of clothing shall occur in the equipment room just prior to entering the shower. (See Figure 4 in the ICR 56) The full personal decontamination system enclosure specified for Large asbestos projects is recommended.
- D. Remote Personal Decontamination System Enclosure. If a personal decontamination system cannot be attached to the regulated abatement work area, due to available space restrictions or other building and fire code restrictions, a remote personal decontamination system enclosure may be used for limited Special Projects as per subpart 56-11, negative pressure tent enclosure

work areas with glovebag only abatement, or if non-friable ACM is being removed in a manner which will not render the ACM friable.

Limitation. If it is found during removal, that the non-friable ACM or asbestos material will become friable during the removal process, and it is logistically possible to attach the decontamination system enclosure, abatement work must stop immediately while the remote personal decontamination system is relocated to be attached and contiguous to the regulated abatement work area.

The following requirements apply for all remote personal decontamination systems:

- 1. Protective Clothing. Workers shall don two (2) sets of disposable protective clothing and a supply of protective clothing shall be kept in the airlocks attached to the regulated abatement work area.
- 2. Location. The remote personal decontamination system shall be constructed as close to the regulated abatement work area as physically possible. If the remote personal decontamination system must be located at the exterior of the building/structure due to space or code restrictions, it shall be constructed within fifty (50) feet of the building/structure exit used for access by the asbestos abatement contractor personnel. The decontamination unit shall be cordoned off at a distance of twenty-five (25) feet to separate it from public areas.
- 3. Airlocks. At a minimum, two (2) extra airlocks as defined in ICR 56 Section 56-2.1 shall be constructed as per ICR 56 Section 56-7.5(b)(11). One shall be constructed at the entrance to the equipment room or equipment/washroom. The other extra airlock shall be constructed at the entrance to the containment or regulated abatement work area(s). These airlocks shall have lockable doorways at the entrance to the airlock from uncontaminated areas. These airlocks shall be cordoned off at a distance of twenty-five (25) feet and appropriately signed in accordance with ICR 56 Section 56-7.4(c). Airlocks shall not be used as a waste decontamination area and shall be kept clean and free of asbestos containing material.
- 4. Designated Pathway. The walkway from the regulated abatement work area to the personal decontamination system or next regulated abatement work area shall be cordoned off and signage installed as per ICR 56 Section 56-7.4(c), to delineate it from public areas while in use during Phase IIA through IID.
- 5. Travel Through Uncontaminated Areas. If at any time a worker must travel through an uncontaminated area to access the personal decontamination area, the worker shall HEPA-vacuum and/or wet wipe his/her outer protective clothing while in the regulated abatement work area, then proceed into the airlock, which serves as a changing area, where he/she shall remove the outer clothing and don a clean set of protective clothing. The worker may then proceed to the personal decontamination system enclosure only along a designated pathway as described above. Travel in any other area shall not be allowed.

- 6. Removal. The remote personal decontamination unit shall be removed only after satisfactory clearance air sampling results have been achieved.
- E. Waste Decontamination System Enclosure Large and Small Asbestos Projects.
 - 1. Enclosure – General. A waste decontamination system enclosure shall be provided outside the regulated abatement work area and shall be attached to the regulated abatement work area. One (1) waste decontamination enclosure for each regulated abatement work area shall be required. This system may utilize adequate existing lighting sources separate from the decontamination system enclosure, or shall be supplied with a GFCI protected temporary lighting system. The waste decontamination system enclosure shall be sized to accommodate the number of workers and equipment for the intended purpose. Such system may consist of existing attached rooms outside of the regulated abatement work area, if the layout is appropriate, that can be plasticized and are accessible from the regulated abatement work area. When this situation does not exist, enclosure systems may be constructed of metal, wood or plastic supports covered with fire-retardant plastic sheeting. A minimum of one (1) layer of six (6) mil fire-retardant plastic sheeting shall be installed on the ceiling, and walls of the enclosure system. At least two (2) layers of six (6) mil fireretardant reinforced plastic sheeting shall be used for flooring protection of this area. This system must be kept clean, sanitary and climate controlled at all times in conformance to all federal, state and local government requirements. This system shall remain and be used until completion of Phase II C of the asbestos project.
 - 2. Rooms and Configuration. A waste decontamination system enclosure shall consist of a washroom and a holding area connected in series but separated from each other by an airlock. There shall be a lockable door to the outside, and there shall be a curtained doorway between the washroom and the regulated abatement work area. (See Figure 2 in the ICR 56)
 - 3. Curtained Doorway. An assembly which consists of at least three (3) overlapping sheets of six (6) mil fire retardant plastic over an existing or temporarily framed doorway. One (1) sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to insure that the sheets hang straight and maintain a seal over the doorway when not in use.
 - 4. Washroom. A room/chamber between the regulated abatement work area and the holding area in the waste decontamination system enclosure, where equipment and waste containers are wet cleaned or HEPA-vacuumed. Adequate drainage and bag/container wash water shall be provided within the room/chamber, as well as a sufficient quantity of clean waste bags/containers.
 - 5. Equipment/Washroom Alternative. Where there is only one (1) exit from the regulated abatement work area, the holding area of the waste

- decontamination system enclosure may branch off from the equipment room of the personal decontamination system enclosure. The equipment room will also be used as a waste washroom. (See Figure 3 in the ICR 56)
- 6. Plastic Sheeting. Waste decontamination system enclosures constructed at the work site shall use at least one (1) layer of six (6) mil fire-retardant plastic sheeting on walls and ceiling. At least two (2) layers of six (6) mil fire-retardant reinforced plastic sheeting shall be used for flooring protection of these areas.
- 7. Enclosure Security. The waste decontamination system enclosure and regulated abatement work area airlock(s) (when remote decontamination systems are used) shall be constructed with lockable doors to prevent unauthorized entry. Enclosures systems located within twenty-five (25) feet of an area of public access shall be fully framed and hard-wall sheathed for safety.
- 8. Drains. The waste washroom shall be equipped with a wash bin of sufficient size to perform waste container washing operations and shall have a submersible pump installed to collect waste water and deliver it to the shower wastewater filtration system where it shall be filtered in accordance with paragraph (b)(9) of this Section.
- 9. Shower/Washroom Alternative Small Asbestos Project. For Small asbestos projects with only one (1) exit from the regulated abatement work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage, but shall be used for waste transfer to carts, which shall be immediately removed from the enclosure. Waste shall be transferred only during times when the showers are not in use. (See Figure 4 in this Section)
- F. Waste Decontamination System Enclosure When Remote Personal Is Allowed. When a remote personal decontamination system enclosure is allowed and utilized for a regulated abatement work area, the following requirements shall apply:
 - 1. Minor Size Regulated Abatement Work Area. No specific waste decontamination system enclosure is required for minor size regulated abatement work areas. The waste generated shall be immediately bagged/containerized within the regulated abatement work area.
 - 2. Small & Large Size Regulated Abatement Work Areas.
 - a. Washroom. An additional chamber shall be constructed within the regulated abatement work area, attached to the existing airlock used to access the work area. The washroom/airlock combination shall be utilized as the contiguous waste decontamination enclosure for waste bagging/containerization and waste transfer activities. The washroom shall be constructed and supplied with equipment/materials consistent with waste decontamination system

- enclosure washroom requirements for contiguous personal and waste decontamination system enclosures.
- b. Removal. The washroom chamber shall be removed only after satisfactory clearance air sampling results have been achieved.

3.02 PERSONNEL PROTECTION AND DECONTAMINATION PROCEDURES:

- A. General: The Contractor shall take all safety measures and precautions necessary to protect his/her employees and building occupants in accordance with OSHA Standard 29 CFR 1926, EPA Standard 40 CFR, Part 61, Subpart M, and applicable state and city regulations. The Contractor shall be solely responsible for enforcing personnel protection requirements.
 - 1. After the installation of the personal decontamination system, full PPE in compliance with current OSHA regulations shall be worn in regulated abatement work areas during preparation activities, for all friable OSHA Class I or Class II asbestos projects. Asbestos abatement contractor's respirator selection, filter selection, medical surveillance and respiratory training must be consistent with current OSHA regulations. Appropriate respiratory protection is also required of all authorized visitors.
 - 2. Workers or authorized visitors shall not eat, smoke, drink, or chew gum or other substances while in the work area(s) or decontamination area(s).
 - 3. Contaminated worker footwear, eye protection, and hard hats shall be stored in the equipment room when not in use in the work area and, upon completion of asbestos abatement, disposed of as asbestos-contaminated waste or decontaminated for reuse.
 - 4. Entry to the personal and waste decontamination system enclosures shall be restricted to the asbestos contractors involved with the asbestos project, appropriately certified employees of the asbestos contractors, authorized visitors, police, fire and other public safety personnel.
 - 5. Asbestos workers shall not wear any jewelry; e.g. watch, necklace, etc. while in the work area or decontamination area.
- B. Worker Respiratory Protection: With approval from the Dobbs Ferry Union Free School District Environmental Consultant, historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for the time interval prior to the Contractor establishing the eight-hour time weighted average (TWA) for an abatement task. Historical data provided by the Contractor shall be based on OSHA personal air monitoring of the "breathing zone" of his/her employees for other asbestos abatement projects, and the data were obtained during work operations conducted under work place conditions closely

resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations. Documentation of aforementioned results shall be presented to the Dobbs Ferry Union Free School District Environmental Consultant for review of applicability. (See "Submittal, Pre-Project Information." This will not relieve the Contractor in providing personal air monitoring to determine the TWA for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101. After the TWA is established, the Contractor may provide respirators as presented in the Specification. The minimum level of protection for TSI and/or Surfacing Materials abatements is full face-piece Powered Air Purifying Respirator (PAPR).

- 1. Review material safety data sheets (MSDS) for products to be used during the work. Follow recommendations as given by the product manufacturer for personnel protection required to be worn during product application.
- 2. Personal Air Monitoring Requirements: The Contractor's CIH shall be responsible for development and implementation of a personal air monitoring program in accordance with OSHA Standard 29 CFR 1926.1101, good industrial hygiene practices, and the requirements herein. Personal air monitoring shall be performed by an independent testing laboratory and supervised by the Contractor's CIH. Documentation of air sampling shall include as a minimum, calculations of minimum sample volume to achieve necessary detection limits; sampling time; sampling location (or subject); evidence of periodic inspection of sampling equipment; documentation of daily pre- and post-calibration of sampling equipment; detailed description of worker protective devices; description of any typical environmental conditions; and a description of work practices/procedures/controls in operation during the sampling period. Documentation of sample analysis shall include, as a minimum, sample identification; total sample duration, sample flow rate; the "Limit of Reliable Quantification"; total air volume; total fibers counted (with work sheets); total fields counted; blank filter analysis; and reticule field area. Airborne fiber concentrations in fibers per cubic centimeter (f/cc) shall be calculated and reported at the 95 percent confidence level.
- 3. Full-shift personal exposure air sampling of workers shall be performed to establish the 8-hour (TWA) exposure. Such sampling shall be conducted for each employee (or representative group of employees, at least one sample per eight man crew) expected to evidence the highest exposure in each work area for each type of activity on the first shift that site preparation, removal, or cleanup activities occur. Similarly, 30-minute personal exposure air sampling shall be conducted during activities anticipated to produce the highest airborne concentrations to determine the Excursion Limit. Personal exposure sampling shall be repeated everyday as per protocol requirements where removal and cleanup operations are

conducted for the duration of the project, or at any time that conditions indicate to the Contractor or the Contractor's CIH that the most recent personal sampling results are no longer indicative of employee exposure. PCM personal samples shall be collected and analyzed according to the OSHA Reference Method in OSHA Standard 29 CFR 1926.1101, Appendix B.

C. Personnel Entrance and Decontamination Procedures for Full Containment removal methods:

- 1. All workers and authorized visitors shall enter the work area through the worker decontamination enclosure system.
- All individuals who enter the work area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, contractor(s), the project, each work area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity.
- Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator (with new filters, if appropriate) and clean protective clothing before entering the work area through the shower room and equipment room.
- Each worker or authorized visitor shall, each time he/she leaves the work area: remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the work area is not permitted outside the work area.

D. Personnel Entrance and Decontamination Procedures for Gross Removal Operations Utilizing Negative Pressure Tent removal methods:

1. All workers and authorized visitors shall enter the work area through the worker decontamination enclosure system.

- All individuals who enter the work area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, contractor(s), the project, each work area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity.
- Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator (with new filters, if appropriate) and clean protective clothing before entering the work area through the shower room and equipment room.
- Each worker or authorized visitor shall, each time he/she leaves the work area: remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the work area is not permitted outside the work area.
- E. Personnel Entrance and Decontamination Procedures for Gross Removal Operations Utilizing Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS removal methods:
 - 1. All workers and authorized visitors shall enter the work area through the worker decontamination enclosure system.
 - All individuals who enter the work area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, contractor(s), the project, each work area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity.
 - Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator (with new filters, if appropriate) and clean protective clothing before entering the work area through the shower room and equipment room.

- Each worker or authorized visitor shall, each time he/she leaves the work area: remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the work area is not permitted outside the work area.
- **3.03 PREPARATION OF WORK AREA:** The following Paragraph "General Preparations" outlines procedures applicable to all work areas. Work procedures specific for preparing each asbestos removal area is addressed in its respective Subparagraph. If a site specific variance is approved, procedures outlined in the variance will supercede this specification.
 - A. **General Preparations:** The following general preparations shall be used for all work areas being abated:
 - 1. Erect barricades; post notices and warning signs.
 - 2. Provide and install decontamination enclosure systems in accordance with Article 3.01, "Decontamination Enclosure Systems" of this Section.
 - 3. Seal drains and other collection devices with 6-mil plastic and plywood, as necessary, and provide a system to collect all water used by the Contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.
 - 4. Ensure that the Contractor's approved Fall Protection Equipment (if applicable) is in place, in operating condition, and in operation during work described in this section.
 - 5. Maintain emergency and fire exits from the work areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with florescent paint or other effective designations to permit easy location from anywhere within the work area. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.

- 6. Temporary lighting within the work area and decontamination system shall be provided as required to achieve minimum illumination levels.
- 7. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be equipped by manufacture with HEPA filtered local exhaust ventilation.
- 8. Hot and cold water may not be available in all work areas. In such cases sufficient heating equipment shall be provided to maintain a necessary supply of hot water for showers.

B. Full Containment removal methods:

- 1. Request that the Environmental Consultant perform area monitoring and establish a background count prior to the preparatory operations for each removal area.
- 2. Erect barricades; post notices and warning signs.
- 3. Shut down, isolate, and lock out or tag heating, ventilating, and air conditioning (HVAC) systems which serve or which pass through the work area. Vents within the work area and seams in HVAC components shall be sealed with tape and two layers of plastic sheeting. Filters in HVAC systems shall be removed and treated as asbestos-contaminated waste.
- 4. Shut down, disconnect, and lock out or tag all electric power to the work area so that there is no possibility of its reactivation until after clearance testing of the work area.
- 5. Provide and install decontamination enclosure systems in accordance with Article 3.01 (B), "Decontamination Enclosure Systems". Prior to installation of decontamination enclosure system, the floor area shall be covered with one layer of 6-mil plastic sheeting and then 1/2 inch rigid flooring prior to normal decon construction. This procedure (to be implemented only when required) is necessary to protect the existing carpet from being contaminated.
- 6. Seal floor drains, sumps and other collection devices with two layers of 6-mil plastic and plywood, as necessary, and provide a system to collect all water used by the Contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.
- 7. Ensure that the Contractor's communication equipment is in place, in operating condition, and in operation during work described in this Section.

- 8. Separate by means of airtight barriers (isolation barriers) parts of the building that are not included in the work area(s) from parts of the building that will undergo asbestos abatement.
- 9. Seal with isolation barriers: open doorways, cased openings, and corridors which will not be used for passage during work. Any opening equal to or more than 32 square feet shall be sealed with solid (plywood or oriented strand board sheathing material of at least 3/8-inch thickness fastened to the regulated abatement work area side of the barrier partition) isolation barriers, except that where any one dimension is one foot or less.
- 10. Isolation barriers shall extend from the floor to the drop ceiling and form an airtight seal. They shall be built using wood or metal framing at 24-inch on-center faced with plywood sheathing, and shall be braced as necessary. Both sides of the isolation barrier shall be covered with a double layer of 6-mil plastic sheeting, with joints staggered and sealed with tape. Edges of the temporary partition at the floor, walls, and ceiling shall be taped and caulked airtight. Isolation barriers larger than 32 square feet shall be sheathed on the work area side with 3/8 inch plywood or oriented strand board (OSB) sheathing.
- 11. Completely seal airtight and isolate the work area. All openings, including but not limited to doorways, windows, tunnels, ducts, grilles, cracks, diffusers, openings through which pipe conduit passes, and any other penetrations of the work area, shall be covered with plastic sheeting taped or caulked airtight. Refer to updated ICR 56 for the elevator shaft ports isolation details.
- 12. Maintain emergency and fire exits from the work areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with fluorescent paint or other effective designations to permit easy location from anywhere within the work area. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.
- 13. Temporary lighting within the work area and decontamination system shall be provided as required to achieve minimum illumination levels.
- 14. After sealing and plasticizing the area install and initiate operation of at least two air filtration devices to provide a negative pressure of at least -0.02 inches of water and four (4) changes per hour within the work area relative to surrounding non-work areas. Do not shut down AFD's until the work area is released to the Owner following final clearance procedures. All air filtration device filters shall be new and shall be

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- installed on-site under the supervision of the Environmental Consultant. The contractor shall utilize Applicable Variance-A-2 (AV-A-2) at the locations with negative unit exhaust greater than 25 foot in length.
- 15. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacture equipped with HEPA-filtered local exhaust ventilation.
- 16. Scaffolds shall be provided for workers engaged in work that cannot safely be performed from the ground or other solid work area surface.
- 17. Work Area Precleaning Procedures: After establishing the decontamination enclosure system, prepare and pre-clean the work area as specified below and as indicated by the drawing notes:
 - a. Movable and loose items not removed by the facility from work areas shall be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate and shall be removed from the work area and stored at the Owner's direction.
 - b. Movable and loose items contaminated with asbestos shall be wrapped or placed in labeled ACM bags. Sealed ACM bags shall be removed from the work areas and properly discarded as asbestos-contaminated waste.
 - c. Fixed objects within the work area shall be pre-cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Joints of covers or casings shall be sealed with tape and fixed objects enclosed with a minimum of two layers of 6-mil plastic sheeting sealed airtight with tape. Disassembly of these fixed objects is not required unless otherwise noted. Fixed objects shall include, but not be limited to, light fixtures, junction boxes, hangers and black carrying channels.
 - d. Prior to being plasticized, the work areas shall be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.
- 18. Plasticize the area after pre-cleaning, using the following procedure:
 - a. Cover floor with one layer of 6-mil plastic sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.
 - b. Cover walls with one layer of 6-mil plastic sheet, lapping wall layer a minimum of 12 inches, and seal layer to floor layer.

- c. Cover ceiling with one layer of 6-mil plastic sheet, lapping wall layer a minimum of 12 inches, and seal layer to wall layer
- c. Repeat procedure for second layer. All joints in plastic sheets shall be glued and taped in such a manner as to prohibit air passage. All seams within a layer shall be separated by a distance of at least six (6) feet and sealed airtight with duct tape. All seams between layers shall be staggered at least two (2) feet.
- 19. Areas immediately adjacent to removal areas, such as corridors or hallways which are not in work areas but are necessary routes to and from work areas, shall be protected with two layers of 6-mil plastic sheet on floors and two layers of 6-mil plastic sheet on walls and ceilings.

C. Negative Pressure Tent removal methods:

- 1. Tent enclosure work areas shall at a minimum have decontamination areas installed and utilized, as per the requirements of Section 56-11.3.
- 2. Tents with greater than twenty (20) square feet of floor space, that are scheduled for gross removal of friable ACM, PACM, or asbestos material, shall be constructed of two (2) layers of six (6) mil fire-retardant plastic sheeting and shall include walls, ceiling and a floor (except for portions of walls, floors and ceilings that are the removal surface) with double folded seams. Seams shall be duct taped airtight and then duct taped flus h with the adjacent tent wall.
- 3. Tents with no gross removal of friable ACM, PACM or asbestos material, shall be constructed of one (1) layer six (6) mil fire-retardant plastic sheeting and shall include walls, ceiling and a floor (except for portions of walls, floors and ceilings that are the removal surface) with double –folded seams. Seams shall be duct taped airtight and then duct taped flush with the adjacent tent wall.
- 4. Tents or tent-like structures or enclosures shall be adequately supported and reinforced to withstand local environmental conditions and the negative pressures developed within them.
- 5. An airlock shall be constructed as per Section 56-7.5(b)(11), at the entrance to each tent that utilizes remote decontamination system facilities. Each tent and airlock shall be cordoned off twenty-five (25) feet from it perimeter, or the interior space/room where the tent and airlock is located shall be secured from non-certified personnel or public access, and signage shall be installed as per Section 56-7.4(c).
- 6. Manometers consistent with the requirements of Section 56-7.8(a)(4), are required for negative pressure tent enclosure regulated abatement work

areas with OSHA Class I 12 NYCRR 56 Subpart 7, Page 69 abatement. Negative air shall be maintained at four (4) air changes per hour for non-friable and glovebag abatement tent enclosure work areas. Eight (8) air changes shall be maintained for friable gross removal tent enclosure work areas. If a HEPA-filtered vacuum is used for a Minor size abatement tent enclosure work area to maintain the required air changes, after final cleaning is completed twenty (20) minutes shall elapse, then ventilation may be stopped, clearance air samples collected if required, and the tent sealed until results are read. If air sample results are unacceptable, ventilation shall be re-established, the area recleaned and new samples taken.

- D. Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS removal methods:
 - 1. The immediate work area shall be considered to be the area from which the asbestos containing materials are actively being removed. The asbestos project regulated abatement work area shall extend twenty-five (25') feet from the perimeter of the immediate work area and shall have signage in accordance with Section 56-7.4. An airlock shall be required at the entrance to the regulated abatement work area to serve as a changing area, if the workers shall have to pass through enclosed publicly occupied space, such as from a roof through an interior stairway, to access the decontamination units.
 - a. Where the asbestos project regulated abatement work area extends outward twenty-five (25) feet and extends downward one (1) floor to encompass a passage or vehicular door which must be used for either a primary entrance or by an emergency vehicle, thereby precluding sealing such door, a tunnel structure (with sides and roof) built of plywood sheeting, covered with at least two (2) layers of at least six (6) mil plastic, shall extend outward twenty-five (25) feet horizontally from the line of vertical projection of the roof edge downward to grade level
 - 2. Regulated abatement work area preparation shall also comply with Sections 56-7.2, 7.3, 7.4, 7.5, 7.6, 7.7 and 7.9 of NYS DOL 12 NYCRR Part 56.
 - 3. The personal and waste decontamination system enclosures can be remote but must be within fifty (50) feet of the building/structure entrance used by the asbestos handlers (workers), and shall be removed only after obtaining satisfactory clearance air results for the regulated abatement work area or an acceptable visual inspection has determined that the abatement is complete, as per Section 56-9. 2(e) of NYS DOL 12 NYCRR Part 56.

4. Prior to the placement of critical barriers, affected surfaces shall be precleaned using HEPA-filtered vacuum equipment and wet cleaning methods. All openings within the regulated abatement work area shall be sealed with critical barriers installed as per Section 56- 7.11(a), prior to beginning Phase II B activity on the project. The critical barriers shall be removed only after satisfactory clearance air sampling results have been obtained or the asbestos project is complete. The requirements of Section 56-7.11(b-e) of NYS DOL 12 NYCRR Part 56 do not apply. Additional requirements are as follows:

Roofs:

All openings (including operable windows, doors, ducts, grilles, communicating openings, etc.) one (1) story above and one (1) story below the roof level of the regulated abatement work area (this includes any building/structure within twenty-five (25) feet of the immediate work area), shall be sealed directly with two (2) layers of at least six (6) mil flame-retardant plastic sheeting. All vent openings which cannot be sealed shall be extended vertically a minimum of eight (8) feet and remain in operation.

A polyethylene drape or curtain may be used instead of plasticizing the windows individually. The drape may be removed after the asbestos project is complete.

The drape or curtain, if used, shall be made of two (2) layers of a continuous eighteen (18) foot curtain (drape) of at least six (6) mil plastic hung from the top of the wall or parapet. The plastic curtain shall be secured using nailer strips and ram set charges or other methods approved by the building/structure owner's authorized representative. The bottom of the plastic curtain shall be sufficiently weighted or anchored to prevent lifting due to winds. Curtain seams shall overlap at least twelve (12) inches and be sealed with duct tape front and back. The curtain ends and each seal shall be reinforced by stapling furring strips to the plastic. The plastic curtain shall extend a minimum of fifteen (15) feet beyond the last opening within twenty-five (25) feet of the regulated abatement work area. When removed, the plastic curtain shall be disposed of as asbestos waste.

Any windows on the floor below or above and within twenty-five (25) feet of the immediate work area need to be plasticized, but if safety reasons dictate, they may be plasticized from inside the building/structure.

Any fixed or non-operable windows on the floor below or above and within twenty-five (25) feet of the immediate work area need not to be plasticized, but shall be sealed using caulking or duct tape.

Facades:

Removals without tents will require plasticizing or sealing of nearby windows within twenty-five (25) feet of the immediate work area, placement of dropcloths, plasticizing of a man-lift or scaffolding and other operational safeguards as outlined below.

For larger work area removals, any operable windows or openings to the building at the work level or on the floor below within twenty- five (25) feet of the immediate work area shall be plasticized with two (2) layers of six (6) mil fire retardant polyethylene sheeting. The windows can be plasticized outdoors, or for reasons of safety, from the indoors. Window, door and louver units subject to complete removal must have their openings plasticized at the interior of the building. Windows that are fixed or non-operable and that will remain sealed airtight for the duration of abatement activities, do not require installation of critical barriers.

Under areas where non-friable materials are removed without tents, a dropcloth, made of six (6) mil fire retardant polyethylene sheeting, shall be placed on the ground below the work area to prevent spread of any ACM remnants. This dropcloth shall be a minimum of ten (10) feet wide with an additional ten (10) feet of width for every floor above a 1st floor level where removal work will take place, up to a maximum of thirty (30) feet of width measured perpendicular to the building/structure. In addition, if a straight scaffolding, man-lift, swing scaffolding or similar equipment is used for areas above the 1st floor, the lift/scaffolding unit shall be plasticized with two (2) layers of six (6) mil fire retardant polyethylene on the platform, with plastic sheeting extended vertically to waist-high (as so equipped) guardrail sides and back of the lift unit. While the platform/lift walking surfaces must be plasticized, the asbestos abatement contractor must provide proper traction surfaces or equipment to assure the safety and comfort of abatement workers while performing abatement activities on the lift/scaffold equipment. After non-friable ACM is removed from each work location, the platform and plasticized surfaces toward the building shall be wet wiped and/or HEPA vacuumed clean before reuse. The plasticizing on the lift or scaffolding shall be periodically inspected during use and repaired as needed.

3.04 PRE-REMOVAL INSPECTIONS:

A. Prior to removal of any ACM the Contractor shall notify the Dobbs Ferry Union Free School District Environmental Consultant and request a pre-removal inspection. Posting of warning signs, plasticizing of work area, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of Dobbs Ferry Union Free School District

Environmental Consultant. The Contractor shall not begin asbestos removal until the Dobbs Ferry Union Free School District Environmental Consultant approves the work area preparations.

3.05 <u>MAINTENANCE OF CONTAINED WORK AREA AND DECONTAMINATION</u> ENCLOSURE SYSTEMS:

- A. Repair damaged barriers and remedy any defects immediately upon their discovery. Visually inspect barriers at the beginning and end of each work period.
- B. Visually inspect non-Work Areas and the decontamination enclosure system for water leakage. Check the floor below, ceiling and walls, and view beneath/or around the decontamination enclosure system, for signs of leakage. Perform the visual inspection a minimum of twice each 8- hour work shift.
- C. Ensure that both hot and cold water exist in sufficient supply for the decontamination enclosure system.
- **3.06 REMOVAL OF ASBESTOS-CONTAINING MATERIAL:** The Asbestos Contractor shall be responsible for the proper removal of ACM from the Work Area using standard abatement industry removal techniques. The Environmental Consultant or their representative shall observe the Work. Approval of the Asbestos Contractor's abatement techniques is required by the Environmental Consultant to allow for the continuance of work.

A. Full Containment removal methods:

Removal of asbestos-containing material using full containment procedures (large projects).

- 1. The asbestos material shall be adequately wetted with amended water. Sufficient time shall be allowed for penetration to occur prior to abatement activities. All friable asbestos materials shall be thoroughly saturated. All non-hygroscopic (material that resists wetting) asbestos material shall be thoroughly wetted, prior to and during abatement.
- 2. Remove the saturated asbestos material in small sections. As it is removed, pack the material in sealable plastic bags which shall be placed in labeled drums for transport. Remove insulation materials carefully from equipment; do not permit them to fall to the floor.
- 3. After completion of all stripping work, surfaces from which ACM have been removed shall be wet brushed and sponged or cleaned by some equivalent method to remove all visible residue. (Do not use wire brushes.)

- 4. After the ACM removal and bagging, the bagged waste shall be HEPA-vacuumed then wet cleaned and transferred into the shower room for double bagging. The goose-neck and double-bagged waste shall be transferred outside the clean room for its final transfer for storage in an enclosed waste container.
- 5. All accumulations of asbestos waste material shall be containerized and removed. Non-metal shovels and HEPA-vacuums may be used to pick up or move waste except in the vicinity of isolation barriers which might be breached. The areas around isolation barriers shall be cleaned utilizing rubber or plastic dustpans, squeegees or shovels. HEPA-vacuums shall be used to clean all surfaces after gross cleanup.
- 6. First Cleaning, Lockdown Encapsulation and Top Layer Removal. All surfaces of the regulated abatement work area shall be first wet-cleaned using rags, mops and sponges. For collecting excess liquid and wet debris, a wet purpose HEPA filtered shop vacuum may be used and shall be emptied prior to removal from the regulated abatement work area. When the first cleaning has been completed, a thin coat of a lockdown encapsulant agent shall be applied to all surfaces within the regulated abatement work area which were not the subject of removal or abatement. In no event shall lockdown encapsulant be applied to any surface which was the subject of removal or other abatement response activity, prior to obtaining satisfactory clearance air results for the regulated abatement work area. Once the lockdown encapsulant has been applied, and the appropriate waiting/settling or drying time requirements of ICR 56 have been met, the cleaned, exposed top barrier layer of plastic sheeting shall then be removed from walls, ceilings and floors. Windows, doors, HVAC system vents and other openings shall remain sealed. Decontamination system enclosures shall remain in place and shall continue to be utilized.
- 7. Second Cleaning and Bottom Layer Removal. After the first cleaning, at least twelve (12) hours shall be allowed for asbestos to settle. After the top layer of plastic sheeting has been removed, all objects and surfaces in the regulated abatement work area shall be HEPA-vacuumed and then wetcleaned. After the second cleaning and waiting/settling or drying time requirements of this Subpart, then the remaining bottom layer of plastic sheeting on walls, ceilings and floors shall be removed. All windows, doors, HVAC system vents and all other openings shall remain sealed.
- 8. Third or Final Cleaning and Visual Inspection. After the bottom layer of plastic sheeting has been removed, all objects and surfaces in the regulated abatement work area shall be HEPA-vacuumed and then wet-cleaned. After the final cleaning is complete, clearance air sampling shall not commence until the appropriate waiting/settling or drying time requirements of NYS DOL 12 NYCRR Part 56 have elapsed and a visual

inspection has been completed by the project monitor to confirm that the scope of abatement work for the asbestos project is complete, and no visible asbestos debris/residue, pools of liquid, or condensation remain. The asbestos abatement contractor supervisor must complete a satisfactory visual inspection for completeness of abatement and cleaning, prior to commencement of the project monitor visual inspection.

B. Negative Pressure Tent removal methods:

Gross Removal of Interior Asbestos-Containing Materials (Tent Enclosure):

- 1. The asbestos material shall be adequately wetted with amended water. Sufficient time shall be allowed for penetration to occur prior to abatement activities. All friable asbestos materials shall be thoroughly saturated. All non-hygroscopic (material that resists wetting) asbestos material shall be thoroughly wetted, prior to and during abatement.
- 2. Only one type of asbestos containing material shall be abated at a time within an enclosure. Prior to the abatement of another type of asbestos containing material, the area shall be cleaned. (See Section 8.6 Multiple Abatement within a Single Regulated Abatement Work Area, of NYS DOL 12 NYCRR Part 56)
- 3. ACM, PACM and asbestos material, on detachment from the substrate, shall be directly bagged or dropped into a flexible catch basin and subsequently bagged or containerized. Materials removed in negative pressure tent enclosure work areas shall be bagged or containerized immediately upon detachment. Additional amended water shall be added as necessary to the waste bags/containers to ensure that all waste remains adequately wet within the bag/container.
- 4. Where ACM, PACM or asbestos material was removed, any exposed edges of material that remain shall be sealed with wettable cloth or otherwise encapsulated with a suitable non-asbestos material, prior to commencement of final cleaning and collection of clearance air samples.
- C. Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS Removal:

Removal of ACM shall utilize manual wet methods for all non-friable ACM removals, and rotating blade roof cutters for roofing removals, as applicable. In no event shall methods be used that may render the ACM friable.

- 1. Residual non-friable ACM shall be wet scraped and HEPA vacuumed. Materials removed shall be containerized or immediately wrapped in two (2) layers of six (6) mil fire retardant plastic sheeting and secured air tight prior to transport to the waste decontamination facility.
- 2. Under façade areas where non-friable ACM is to be removed without tents, whenever possible, an asbestos handler (worker) with a HEPA vacuum will position the vacuum hose within four (4) inches of the material being removed to capture small pieces of non-friable ACM and asbestos fines. The hose end will be positioned so that as many smaller pieces of material as possible will fall into the vacuum hose end. Larger pieces of ACM should be immediately bagged or containerized.
- 3. Asbestos containing materials will not be allowed to accumulate in the work area or on the drop cloth.
- 4. In lieu of using an exterior chute as per Section 8.4(g) of NYS DOL 12 NYCRR Part 56, waste bags and containers may be lowered to the waste trailer/dumpster by crane or hoist using a temporary waste transfer container of adequate size and strength.

3.07 <u>ACM WASTE PACKAGING AND LOAD OUT PROCEDURES</u>:

- A. Packaging of ACM shall conform to OSHA Standard 29 CFR 1926.1101, DOT 49 CFR 171,172, and 173, EPA Standard 40 CFR Part 61, New York City Department of Sanitation (in relation to transport, storage, and disposal of ACM) and the requirement as heretofore specified. ACM waste shall be placed in a wet condition into properly labeled disposal bags or sealed in two layers of 6-mil plastic sheeting wrapped airtight and properly labeled. Materials to be transported through a non-Work Area building space shall be placed in hard wall shipping containers for handling. Specific requirements for decontamination of waste containers, and load out through the decontamination enclosure systems is outlined below:
- B. Frequency of Waste Removal: Properly packaged and labeled asbestos waste shall be removed from the site on a daily basis. Under no circumstance shall asbestos waste be stored on site. The waste hauler and landfill shall be as indicated on the notifications to regulatory agencies.
- C. Waste Load-out Through Waste Decontamination Unit: Place asbestos waste in disposal bags. Large items not able to fit into disposal bags shall be wrapped in one layer of 6-mil thick plastic sheeting. Clean outer covering of asbestos waste package by wet cleaning and/or HEPA vacuuming in a designated part of the Work Area. Move wrapped asbestos waste to the washroom, wet clean each bag or object and place it inside a second disposal bag, or a second layer of 6-mil plastic sheeting, as the item's physical characteristics demand. Air volume shall be minimized, and the bags or sheeting shall be sealed airtight with tape.

- D. The clean containerized items shall be moved directly to the Waste Hauler's truck pending load-out to storage or disposal facilities.
- E. Workers who have entered the decontamination enclosure system from the uncontaminated non-work area shall perform load-out of containers from the decontamination enclosure holding area. Dress workers asbestos waste to storage or disposal facilities in clean overalls of a color different than from that of coveralls used in the Work Area. Ensure that workers do not enter from uncontaminated areas into the equipment washroom or the Work Area. Ensure that contaminated workers do not exit the Work Area through the equipment decontamination enclosure system.
- F. Thoroughly clean the decontamination enclosure system immediately upon completion of the waste load-out activities, and at the completion of each work shift.
- G. Labeled ACM waste containers or bags shall not be used for non-ACM debris or trash. Any materials placed in labeled containers or bags, whether turned inside out or not, shall be handled and disposed of as ACM waste.
- **3.08** <u>CLEANUP AND CLEARANCE TESTING OF WORK AREAS</u>: The following clean-up procedures shall be performed during abatement.

A. Full Containment removal methods:

Clearance procedure for areas completed utilizing full enclosures is described in the following four step method:

Step 1. First Cleanup Visual Inspection

Step 2. Second Cleanup Visual Inspection

Step 3. Third Cleanup Visual Inspection

Step 4. Final Re-occupancy Visual Inspection and fiber clearance count of <0.01 fiber/cc of air using PCM NIOSH method 7400 analysis procedures or <70 s/mm² using TEM AHERA 40 CFR Part 763 Appx. A subpart E methods.

- 1. If required during Phase IIB, the negative pressure ventilation units shall remain in continuous operation during implementation of Phase IIC, including observance of settling/waiting periods and drying times.
- 1. First Cleanup:

All surfaces of the regulated abatement work area shall be first wetcleaned using rags, mops and sponges. For collecting excess liquid and wet debris, a wet purpose HEPA filtered shop vacuum may be used and shall be emptied prior to removal from the regulated abatement work area. When the first cleaning has been completed, a thin coat of a lockdown encapsulant agent shall be applied to all surfaces within the regulated abatement work area which were not the subject of removal or abatement. In no event shall lockdown encapsulant be applied to any surface which was the subject of removal or other abatement response activity, prior to obtaining satisfactory clearance air results for the regulated abatement work area. Once the lockdown encapsulant has been applied, and the appropriate waiting/settling or drying time requirements of this Subpart have been met, the cleaned, exposed top barrier layer of plastic sheeting shall then be removed from walls, ceilings and floors. Windows, doors, HVAC system vents and other openings shall remain sealed. Decontamination system enclosures shall remain in place and shall continue to be utilized.

3. Second Cleanup:

After the top layer of plastic sheeting has been removed, all objects and surfaces in the regulated abatement work area shall be HEPA-vacuumed and then wet-cleaned. After the second cleaning and waiting/settling or drying time requirements of this Subpart, then the remaining bottom layer of plastic sheeting on walls, ceilings and floors shall be removed. All windows, doors, HVAC system vents and all other openings shall remain sealed.

4. Third Cleanup:

After the bottom layer of plastic sheeting has been removed, all objects and surfaces in the regulated abatement work area shall be HEPA-vacuumed and then wet-cleaned. After the final cleaning is complete, clearance air sampling shall not commence until the appropriate waiting/settling or drying time requirements have elapsed and a visual inspection has been completed by the project monitor to confirm that the scope of abatement work for the asbestos project is complete, and no visible asbestos debris/residue, pools of liquid, or condensation remain. The asbestos abatement contractor supervisor must complete a satisfactory visual inspection for completeness of abatement and cleaning, prior to commencement of the project monitor visual inspection.

5. Final Re-occupancy:

- a. Final visual inspection for re-occupancy will be done by the IH for the purpose of observing whether cleaned areas are free of dust, dirt, and debris. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.
- b. When the work area passes Environmental Consultant's visual reoccupancy inspection, a thin coat of lockdown encapsulant shall be applied to all plastic covered surfaces in the work area.
- c. During the final clearance for re-occupancy air sampling is conducted, the work area shall have a minimum of four air changes per hour.
- d. Final air monitoring shall not begin until at least one waiting period (as per ICR 56 Subsection 56-9.1 (f)) after the area is dry from after the third cleaning and no visible pools of water or condensations are present. Aggressive air sampling procedures shall be used within the work area during clearance air monitoring. Re-occupancy will be approved by the Environmental Consultant if the specified fiber count in the work area is achieved.
- e. Clearance air samples will be collected after abatement according to established air clearance criteria per New York State ICR 56 and AHERA 40 CFR Part 763 Appx. A subpart E.
- f. A minimum of five TEM air samples will be collected inside and five outside the work area to determine final air clearance reoccupancy, provided that the amount of ACM is greater than 160 square feet or 260 linear feet. All TEM results must satisfy the clearance criteria for re-occupancy.
- f. When the work area passes the re-occupancy test, all controls and seals established shall be removed.

B. Negative Pressure Tent removal methods:

Clearance Procedure Utilizing Tent Procedures (For Gross Removal) - Cleaning of the work areas and other contaminated areas shall be conducted in accordance with procedure described below:

Step 1. Clean-up Visual Inspection

Step 2. Final Re-occupancy Visual Inspection and fiber clearance count of <0.01 fiber/cc of air using PCM NIOSH method 7400 analysis procedures or <70 s/mm² using TEM

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AHERA 40 CFR Part 763 Appx. A subpart E methods.

- 1. If required during Phase IIB, the negative pressure ventilation units shall remain in continuous operation during implementation of Phase IIC, including observance of settling/waiting periods and drying times.
- 2. All objects and surfaces in the regulated abatement work area shall be HEPA-vacuumed and then wet-cleaned. After the final cleaning is complete, clearance air sampling shall not commence until the appropriate waiting/settling or drying time requirements have elapsed and a visual inspection has been completed by the project monitor to confirm that the scope of abatement work for the asbestos project is complete, and no visible asbestos debris/residue, pools of liquid, or condensation remain. The asbestos abatement contractor supervisor must complete a satisfactory visual inspection for completeness of abatement and cleaning, prior to commencement of the project monitor visual inspection.
- 3. Clearance air samples will be collected after abatement according to established air clearance criteria per New York State ICR 56 and AHERA 40 CFR Part 763 Appx. A subpart E. The analysis method used and quantity of air samples collected will be based on the type and quantity of material being abated. All PCM and TEM results must satisfy the clearance criteria for re-occupancy.
- 4. When volumes greater than or equal to 1,199 liters for a 25 mm filter have been collected and the average number of asbestos structures on TEM samples inside the abatement area is no greater than 70 s/mm² of filter, the abatement work shall be considered complete without comparing the inside samples to the outside samples.
- C. Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS removal methods:
 - 1. **Clean-Up Procedures During Abatement.** The following clean-up procedures shall be performed during abatement.
 - a. Visible accumulations of loose asbestos containing waste material shall be cleaned up using rubber or plastic dustpans and rubber squeegees or HEPA filtered vacuums. Metal shovels may also be used, except in the vicinity of plastic sheeting, critical barriers and isolation barriers, which could be perforated by these tools. To pick up excess water and gross wet debris, a wet-dry HEPA filtered shop vacuum dedicated to asbestos abatement may be used. This cleaning shall be done whenever there is sufficient asbestos waste material to

- fill a single leak-tight bag/container, or this cleaning shall be done at the end of each work shift whichever shall occur first. Visible debris shall be maintained adequately wet.
- b. Work shall stop whenever excessive water accumulation or flooding is present in the area and shall not resume until the water is collected and disposed of properly.
- 2. **Final Cleaning and Clearance Procedures.** Final clean-up and clearance procedures for abatement shall comply with Section 56-9 of NYS DOL 12 NYCRR Part 56, except that only one (1) stage of cleaning (final) is to be performed. Lockdown encapsulant use is not required.
 - Exemption from Project Monitor Visual Inspection. Asbestos projects which are exempt from clearance air sampling requirements one or twofamily owner occupied residential buildings/structures, are also allowed an exemption from the project monitor visual inspection requirements. For asbestos projects utilizing this exemption, once final cleaning is complete, a visual inspection shall be completed by the asbestos abatement contractor's supervisor to confirm that the scope of abatement work for the asbestos project is complete, and no visible debris/residue, pools of liquid, or condensation remain. The results of this inspection shall be documented by the asbestos abatement contractor's supervisor in the asbestos abatement contractor daily project log, and once the asbestos project is complete the asbestos abatement contractor's supervisor shall also obtain the owner's written acceptance of the final results of the asbestos project within the daily project log.

3.09 <u>DISPOSAL AND TRANSPORTATION OF ASBESTOS-CONTAMINATED WASTE:</u>

- A. Storage of Containerized ACM: As the work progresses, remove sealed and labeled bags of ACM from the Work Area and place in a lockable trailer, dumpster, or other container approved for storage or transport of asbestos waste. The waste container shall be lined with two layers of 6-mil fire retardant plastic on all sides. Asbestos-containing waste shall remain under the positive control of the Asbestos Contractor and must never be left unattended in an area or on a vehicle where unauthorized persons could gain access. Containerized ACM shall be removed from the site on a daily basis. Unless specifically approved in writing by the Owner, ACM shall not be permitted to be stored on site during nonworking hours.
- B. Sealed and labeled bags or waste wrapped in two layers of plastic sheeting sealed airtight shall be used to transport asbestos-contaminated waste to the landfill. Procedures for hauling and disposal shall comply with 40 CFR, Part 61, 49 CFR, Part 171 and 172, and other applicable state, regional, and local government

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- regulations. Procedures for removal from the Work Area and disposal of waste are outlined below:
- C. A properly completed and original "Waste Shipment Record" form shall accompany asbestos waste, which is transported to a disposal site. This form shall be signed and dated by each party who has control over the asbestos waste, and a copy retained by each party as responsibility for the waste is transferred to the next party. All original manifest forms and waste receipts shall be provided to the Architect. The Environmental Consultant shall be provided with copies of all waste manifests.
- D. Trucks hauling asbestos waste shall be totally enclosed to prevent loss or damage to waste container en-route to approved landfill. The interior of the vehicles shall be lined with two layers of 6-mil plastic.
- E. Mark with a visible warning sign during the loading and unloading of asbestos-containing waste all vehicles used to transport the waste material. Danger sign legend, text size, style and arrangement shall conform to the requirements of EPA Standard 40 CFR Part 61.149 (d) (I).
- F. Only sealed plastic bags or completely sealed items shall be deposited in landfill. Damaged, broken sealed windows or leaking plastic bags shall be resealed prior to being deposited in the landfill. Workers shall place asbestos waste in the landfill. Throwing or dumping of containers shall not be allowed. Workers unloading and handling the sealed bags/drums at the disposal site shall wear appropriate personnel protective equipment including respirators and protective clothing.
- G. After the vehicle is unloaded at the landfill, the plastic sheeting that was taped to the floor, sides and top of the truck shall be carefully removed and placed in properly labeled bags for disposal with the rest of the waste.

END OF SECTION

LIST OF SUBMITTALS

SUBMITTAL APPROVED		DATE SUBMITTED	DATE
Pre-Project Submittal:			
1.	Insurance		
2.	All required bonds		
3.	List of Subcontractors		
4.	Health and Safety Plan		
5.	Proof that all required permits and variances have been obtained		
6.	Documentation of Required Qualifications of Workers		
7.	Proof of a respiratory protection program.		
8.	Proof of historic airborne fiber data.		
9.	Proof that a landfill site has been located.		
10.	MSDS of chemicals to be used on this project.		
11.	Asbestos Removal and Disposal Work Plan		
Durin	ng Work Submittal:		
1.	Schedule of Work Changes		
2.	Notarized copy of weekly payroll showing a prevailing wage rate has been paid.		
3.	A "Request For Services" form.		
4.	Results of all air monitoring performed by the Contractor (OSHA)		

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5.	A certified, signed, and completed copy of each " Waste Shipment Record" form (Section 1.07)		
6.	A copy of the bound log book		
Post 1	Project Submittal:		
1.	A notarized "Release of Liens"	 -	
2.	Proof of payment of prevailing wage rate		
3.	Notarized copies of a daily log.		
4.	Compilation in chronological order of all air monitoring records pertaining to this project.		
5.	Compilation of all completed and signed Waste Shipment Record forms.		
6.	Copies of notifications to applicable agencies.		
7.	Paid invoice verifications for sub-contractor (for Time and Material job), service contract agreement, insurance certificates, copies of the workers licenses, and other required submittals.		

TECHNICAL SPECIFICATIONS

ASBESTOS ABATEMENT PROJECT AT:

DOBBS FERRY UFSD SPRINGHURST ELEMENTARY SCHOOL 175 WALGROVE AVENUE DOBBS FERRY, NY

Prepared for:

DOBBS FERRY UNION FREE SCHOOL DISTRICT

Prepared by:



37 MOORE AVENUE MT. KISCO, NY 10549

August 6th, 2020 Job No. 19806



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SECTION 02081
ASBESTOS ABATEMENT
PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. The Asbestos abatement contractor shall perform the following work as described below and indicated on the drawings. The drawings are only a diagrammatic representation of the Work Areas and do not constitute the actual quantities of material. Asbestos abatement contractor is responsible for the confirmation of the actual total quantities of the Work. The Asbestos Contractor shall provide all plant, labor, equipment and materials complete for performance of the Work in accordance with the Contract Documents. All asbestos material is to be disposed of as ACM waste. Quantities indicted below are confirmed asbestos.

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175 Walgrove Avenue, Dobbs Ferry, NY

1. Drawing DES001

a. Remove and dispose of asbestos-containing friable and non-friable interior and exterior building materials within **Work Areas 1-3** utilizing NYS DOL 12 NYCRR Part 56 11.7 for Non-Friable Flooring and/or Mastic Removal, as well as NYS DOL 12 NYCRR Part 56 11.6 for Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS, or applicable variances.

Work Area #	Location	Asbestos-Containing Material	Approximate Quantity	Removal Procedure
1	Second Floor Library	Carpet Mastic, Gray	1,475 SF	NYS DOL 12 NYCRR Part 56 11.7 Non-Friable Flooring and/or Mastic Removal
2	Second Floor Media Room	Mastic for 4" Gray Vinyl Cove Base, Beige	110 LF	
3	Library/Media Room Roof	Roofing Tar at Bottom	TBD*	NYS DOL 12 NYCRR Part 56 11.6 Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS

^{*} Quantity of material to be affected by scope of work to be determined.

- B. The Contractor is responsible for completing all notifications and variances required to meet the determined start date (if applicable).
- C. If asbestos containments are required, the Contractor shall establish the asbestos containments so as to not interfere with operation of or access to the temporary equipment that shall be installed by others.
- D. The Contractor shall field verify the amount of ACM and familiarize him/her-self with all variable field conditions in the building before the submission of his/her quote. The quantities presented in this specification are approximate only and should not be used solely as the basis for any quote. Any discrepancies or difference in the approximate and actual quantities shall be resolved before the award of any Contract. No change order relative to ACM material quantity will be permitted after the award of the Contract. In the event that suspect materials not included in this Specification are encountered while the work is in progress, such material shall be tested and, if confirmed ACM, removed as ACM, in accordance with the procedures contained herein. The discovery of any new material(s) should not delay the progress of the work as contained in this specification. Payment for any additional work will be considered on a case-bycase basis by the Environmental Consultant and Dobbs Ferry Union Free School District. It is the responsibility of the Contractor to determine and negotiate the full cost of any such payment prior to performance of any additional work.
- F. ACM shall be properly handled, packaged, and transported for disposal in a landfill in accordance with all Federal, State and Local regulations. After September 4, 2006, the Contractor shall follow Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York (Cited as 12 NYCRR Part 56) as amended effective March 21, 2007. All related manifests and shipping logs shall be provided to Dobbs Ferry Union Free School District upon or before the end of the project.
- G. All work shall be accomplished in strict adherence to the project Specification, applicable Federal, State, and Local Regulations. Whenever there is a conflict or overlap of the above references, the more stringent provision shall apply.
- H. The Contractor's industrial hygiene practices during asbestos abatement will be monitored by Dobbs Ferry Union Free School District Environmental Consultant. The Contractor shall be responsible for monitoring his/her own construction safety work practices for compliance with the OSHA regulations.
- I. The Asbestos Contractor shall provide the best available technology, and state-of-the-art procedures and methods of execution, clean-up, disposal, and safety.

- J. The Contractor will be required, if approved by Dobbs Ferry Union Free School District and/or its Representative, to obtain at his/her own expense appropriate variances from regulatory agencies as required to complete the safe removal of asbestos containing material as described in this specification.
- K. Dobbs Ferry Union Free School District environmental consultant will sample all suspect materials that may be identified during the course of demolition, if applicable. The Contractor shall provide access to the consultant to perform the testing and no additional costs will be paid for the time it takes to perform the testing. The contractor shall provide itemized cost proposal to Dobbs Ferry Union Free School District which must include separate costs for the abatement of the individual materials revealed to be ACM (if applicable). Additional asbestos-containing materials shall not be abated without written authorization from Dobbs Ferry Union Free School District or environmental consultant. The contractor will not be compensated for any additional materials that can be encountered during the abatement project, without prior written authorization from Dobbs Ferry Union Free School District or environmental consultant.
- 1.02 PHASING OF WORK: This work shall include asbestos abatement associated with upcoming interior, exterior and roof upgrades project. The Asbestos Contractor shall perform and complete the abatement of asbestos-containing materials during regular working hours, Monday through Friday between 8:00 am and 4:00 pm or as directed by the facility. It is the Contractor's responsibility to ensure that acceptable visual inspection and air monitoring results are obtained with fiber count of <70 Structures/mm2 of air using AHERA analysis method and are completed prior to the return of building occupants or other trades. All work shall be coordinated with Dobbs Ferry Union Free School District and Dobbs Ferry Union Free School District Environmental Consultant prior to start of any work. The Dobbs Ferry Union Free School District Environmental Consultant shall be present whenever any asbestos abatement work is being conducted.
- 1.03 <u>AUTHORITY TO STOP WORK</u>: Dobbs Ferry Union Free School District and the Environmental Consultant shall have the authority to stop the abatement work at any time the contractor's work is not in conformance with the Specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected to the satisfaction of Dobbs Ferry Union Free School District and the Environmental Consultant. Standby time to resolve the problems shall be at the contractor's expense.

1.04 <u>SITE REQUIREMENTS</u>:

A. Noise Control: Provide mufflers or other acceptable means of noise reduction for all equipment to be used by the Contractor. Observe local laws regarding noise control.

- B. Wastewater: All water used by the Contractor during asbestos abatement activities shall be collected and passed through a water filtration system capable of filtering particles down to 5 microns prior to being discharged into the sanitary sewer. The Contractor shall contact the Westchester County engineering department to determine the acceptable location(s) to access the sanitary sewer. The Contractor shall be responsible for connection to the sanitary sewer, and for providing piping, pumps, water filtration systems, and other items necessary to collect, transport, filter, and dispose of the wastewater.
- C. Log In/Out: The Asbestos Contractor must ensure all workers log in and out daily at the site.
- D. The location of the Decontamination Unit shall be as per abatement design drawings. All variations must be coordinated and approved by the site manager and Dobbs Ferry Union Free School District Environmental Consultant.

1.05 **HEALTH AND SAFETY**:

- A. Toxic Effects: The Contractor shall assume all responsibility for any toxic effects to workers from the air supplied to respirators, or from toxic or damaging vapors or residues resulting from the use of encapsulant and/or wetting agents or other substances used by the Contractor during construction.
- B. Chemical/Biological Hazards: The known chemical/biological hazards on site include asbestos-containing material and debris. The Contractor shall provide materials, equipment and training to its workers to ensure their protection from these and any other chemical/biological hazards which may be identified during the course of this work.
- C. Physical Hazards: The Contractor shall provide safety equipment and training to his/her workers to ensure their protection from any physical hazards including but not limited to trip/fall hazards, working at elevation, heat stress, contact with energized (hot) active equipment, noise, overhead bump hazards, and electrical shock that may be present during the Work.
- D. Safety Act: The Occupational and Safety Health Act (OSHA) of 1970, as amended, shall be strictly complied with during the course of this project. This Act shall govern the conduct of the Contractor's workmen, tradesmen, materialmen, and subcontractors, and visitors to the project site.
- E. Accident Prevention: In order to protect the lives and health of his/her employees, the Contractor shall comply with all pertinent provisions of the latest edition of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc. and shall maintain an accurate record of all accidents which occur during the project. An injury or loss of life

must be immediately reported by the Contractor to the Dobbs Ferry Union Free School District and/or its Representatives, and a copy of the Contractor's report to his/her insurer of an accident must be provided to the Dobbs Ferry Union Free School District and/or its Representatives.

- F. Emergency Response: The Contractor shall establish an Emergency Response Team made up of members of his/her work force. Team members shall be trained, organized, and capable of responding in the event of an accident, fire, or other emergency. The Contractor shall designate a site Safety Coordinator to train team members regarding the location and use of site-specific fire/life safety equipment. As a minimum requirement, members of the Emergency Response Team shall be knowledgeable in standard first aid and CPR techniques, fire extinguisher use, and evacuation procedures.
- G. Workmen Protection: The Contractor shall provide and maintain all safety measures necessary to properly protect workmen.
- H. Emergency Actions: In an emergency affecting the safety of life, the work, or adjoining property, the Contractor, to prevent such threatened loss or injury without special instruction or authorization from the Dobbs Ferry Union Free School District and/or its Representatives, is hereby permitted to act at his/her discretion.
- I. Hazard Communication Act: The Contractor shall comply with the Hazard Communication Standard promulgated by the Occupational Safety and Health Administration (OSHA No. 29 CFR 1910.1200). This program ensures that all employers provide the information they need to inform and train employees properly and to design and put in place employee protection program. It also provides necessary hazard information to employees so they can participate in, and support, the protective measures needed at their work place. The contractor shall ensure that labels or other forms of warning are legible in English. Employer having employees who speak other languages must add the information in their languages. See OSHA 29 CFR 1910.1200 for more details.

1.06 WORK SUPERVISION AND COORDINATION:

A. Abatement Contractor's Supervisor: From the start of work through to the project completion the Contractor shall have on-site a responsible and competent supervisor who posses valid NYSDOL Supervisor certifications. As a minimum, the Asbestos Contractor's Supervisor shall meet the qualifications as required by Article 1.12, for a job supervisor. The Supervisor shall be on site during all working hours. When the Supervisor must leave site during work, a temporary Supervisor shall be appointed.

- B. Quality of Work: The Supervisor shall supervise, inspect and direct the Work competently and efficiently, devoting such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. The Supervisor shall be responsible to see that Work complies accurately with the Contract Documents, and that all Work installed is of good quality and workmanship.
- **1.07 SUBMITTALS:** Unless otherwise noted the Contractor shall submit three (3) copies of each APPLICABLE submittal to the Dobbs Ferry Union Free School District Environmental Consultant and its Representatives for review and/or approval. The Contractor shall provide the following:

A. Pre-Project Submittal:

- 1. Certificates of Insurance naming Dobbs Ferry Union Free School District as additional insured.
- 2. All required bonds. All bonds shall be underwritten by a United States based, preferably New York State, A or B rated bonding company.
- 3. List of Subcontractors.
- 4. Health and Safety Plan: Provide a written Health and Safety Plan addressing procedures for work place safety. As a minimum, the following topics shall be addressed in the plan:
 - a. Hazard Communication. Procedure on how physical and health hazards associated with the work are identified and communicated to employees, and name of the person responsible for implementation of the Hazard Communication Program.
 - b. Guidelines for assessment and prevention of heat stress.
 - c. Procedures for using ladders safely.
 - d. Electrical safety procedures.
 - e. Emergency Action Plan: The Contractor shall submit for review a written Emergency Action Plan. This Plan shall outline the contingency actions to be performed for emergencies including fire, accident, power failure, supplied air system failure, breach of work area containment, unexpected asbestos contamination in the site area and on the adjoining grounds, or spilling of asbestos material being hauled to storage and/or disposal. This Plan shall identify the manner in which emergencies are announced, emergency escape procedures and routes, and procedures to

DOBBS FERRY UNION FREE SCHOOL DISTRICT DOBBS FERRY SPRINGHURST ES

account for all employees after evacuation. The Plan shall identify those persons responsible for fire/life safety duties including the Site Safety Coordinator, persons responsible for fire prevention equipment and the control of fuel source hazards, and the members of the Emergency Response Team (see Paragraph "Emergency Response" of this Section). This Plan shall be readily available for review by all workers.

- f. Fall Protection Plan: The Contractor shall submit for review a written Fall Protection Plan. This plan shall outline the actions to be performed to protect personnel when they are working at elevation. The plan shall detail specific fall protection devices to be utilized, training provided to personnel for same and training of designated competent person in charge of and responsible for the elevated work site.
- 4. Proof of written notifications required by Paragraph "Codes, Permits and Standards" of this Section. Proof that all required permits and variances have been obtained.
- 5. Proof of written notification to the local police department, fire department and Facility (include a copy of required by NYS DOL ICR 56 section 56-3.6a ten day notice) that asbestos abatement work is being conducted. As a minimum, the notification letter shall include the address of the Facility, dates work is to be performed, and drawings indicating the areas to undergo abatement.
- 6. Documentation of compliance with all requirements of paragraph "Requirements and Qualifications" of this Section. Submittal shall include:
 - a. Proof that the job supervisors, foremen, and asbestos abatement workers meet State certification and license requirements.
 - b. Proof of a current medical surveillance program for all Contractor's personnel to work on this project.
 - c. Completed and notarized Certificate of Worker's Release for each asbestos abatement worker, workers of other trades, or supervisory personnel who enter the work area or otherwise contact ACM.
- 7. Proof of a respiratory protection program. Submit level of respiratory protection intended for each operation required by the project.

- 8. Proof of historic airborne fiber data. Submit airborne asbestos fiber monitoring data from an independent air monitoring firm to substantiate selection of respiratory protection proposed. Data shall include the following for each procedure required by the work: 1. date of measurement; 2. type of work task monitored; 3. methods used for sample collection and analysis, and; 4. number, duration and results of samples taken.
- 9. Proof that a landfill site has been located, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials have been made. Provide the name and location of the landfill, and waste transport company, if applicable.
- 10. Manufacturer's literature on all proposed job related equipment and products to be used on this project. Include Safety Data Sheets (SDS) for encapsulant, fire retardant plastics, mastic remover and other chemicals to be used on this project.
- 11. A detailed Asbestos Removal and Disposal Work Plan which describes all aspects of the work to be performed for this project. The Plan shall include the following:
 - a. A detailed description of the work area enclosure. Provide shop drawings (with dimensions and locations) of proposed decontamination facilities and work areas. These drawings shall indicate the following: 1) areas to be sealed off and work area boundaries; and 2) proposed layout and location of the decontamination enclosure systems. Include a detailed description of any modifications or changes to be made to the specified negative pressure work area enclosure.
 - b. Specimen of the daily log proposed for use. Minimally, the log should include the date(s) and time(s) when all personnel enter and leave the work area(s).

B. During Work Submittal:

- 1. Schedule of Work Changes: Any changes in the Schedule of Work proposed by the Contractor shall be submitted for approval to Dobbs Ferry Union Free School District no later than seven days prior to the commencement date of the proposed change. A revised Schedule shall be submitted at the end of each week.
- 2. Notarized copy of payroll showing that prevailing wage rates have been paid shall be submitted to the Dobbs Ferry Union Free School District on a weekly basis. Contractor shall use DOL form for wage payment.

- 3. A "Request For Services" form shall be submitted at least 24 hours in advance of required air monitoring tests and inspections to be performed by the Dobbs Ferry Union Free School District Environmental Consultant.
- 4. Results of all air monitoring performed by the Contractor shall be posted within 24 hours for regular abatement project after collection for all workers to see. A copy of the results shall be given to the Dobbs Ferry Union Free School District Environmental Consultant at the same time.
- 5. A certified, signed, and completed copy of each "Waste Shipment Record" form used, and receipts from the landfill operator which acknowledge the Contractor's delivery(s) of material, shall be submitted to the Consultant and Engineer within thirty days following removal of ACM from building.
- 6. A copy of the bound log book.

C. Post Project Submittal:

- 1. A notarized "Release of Liens" in a form acceptable to the Dobbs Ferry Union Free School District. Use the standard AIA form. Such notarized release of all liens shall certify that all subcontractors, labor suppliers, etc., have been paid their pro rate share of all payments to date, that the contractor has no basis for further claim, and will not make further claim for payment in any account after the first payment is made to him.
- 2. Proof of payment of prevailing wage rate to direct employees and subcontractor.
- 3. Notarized copies of a daily log showing the date(s) and time(s) of entrance to and exit from the work area(s) for all persons.
- 4. Compilation in chronological order of all air monitoring records pertaining to this project.
- 5. Compilation of all completed and signed Waste Shipment Record forms, bills of lading, or disposal receipts pertaining to this project.
- 6. Copies of notifications and checks to applicable agencies (see Subparagraph "Pre-Project Submittal Information" of this Section) that the asbestos abatement project has been completed.
- 7. Contractor shall submit the following items as part of his final submittals: Paid invoice verifications for sub-contractor (for Time and Material job), service contract agreement, insurance certificates, copies of the workers licenses (NYSDOL), and other submittal required for the Specification.

- **1.08 FIRE PROTECTION AND EMERGENCY EGRESS:** The Contractor shall be responsible to the security and safeguarding of all areas turned over by the facility to the Contractor. The Contractor shall designate to his/her workers and other building occupants a means of egress in case of emergency.
 - A. The Contractor shall establish emergency and fire exits from the work area. First aid kit, 2 full sets of protective clothing and respirators shall be provided for use by qualified emergency personnel in the clean room of the decontamination facility.
 - B. For full containment only, the Contractor shall provide a secure work area to protect against unauthorized entry into and around the work area. Any hazardous conditions shall be reported to the contractor's Supervisor and the contractor shall correct the hazard immediately. Any intrusion or incident shall be documented in a bound log book which shall be maintained at the project site.

1.09 <u>CLEAN-UP</u>:

- A. Asbestos Related Clean-up: All clean-up work related to asbestos abatement work shall be in strict accordance with general technical requirements and this specification.
- B. Final Site Cleaning: Upon completion of the work, the Contractor shall remove all temporary construction, decontamination facilities, and unused materials placed on site by the Contractor; put the premises in a neat and clean condition; and provide all sweeping, cleaning, and washing required to restore the site to its original condition.

1.10 <u>CODES, PERMITS, AND STANDARDS</u>:

- A. The Contractor shall be solely responsible for compliance with all applicable federal, state (12 NYCRR Part 56 Adopted March 21, 2007), and local laws, ordinances, codes, rules, and regulations which govern asbestos abatement work or hauling and disposal of asbestos waste material. The current issue of each document shall govern. All work shall comply with all applicable codes and regulations as amended including: EPA Title 40CFR, Part 763, OSHA Title 29CFR, part 1910(including sections 1001,134,1926.2 and 1926.1200); EPA Title 40 CRF Part 61; NYSDEC Title 6,Part 364 and NYSDOH Title 10,Part 73
- B. Before starting the work, the Contractor shall examine the Technical Specification for compliance with codes and regulations applicable to the work and shall immediately report any discrepancy to the Dobbs Ferry Union Free School District Environmental Consultant.

- C. Where conflict among requirements or with these Specifications exists, the more stringent requirements shall apply.
- D. Permits, State Licenses, and Notifications: The Contractor shall be responsible for obtaining necessary permits, variances, state licenses, and certifications of personnel in conjunction with asbestos removal, hauling, and disposition and shall provide timely notification of such actions as may be required by federal, state, regional, and local authorities. Fees and/or charges for these licenses, permits, and notifications shall be paid by the Contractor. Contractor shall use all notification forms where applicable.
 - 1. Agency Notification: At least 10 days prior to commencement of any asbestos removal, the Contractor shall prepare written notification to EPA Region 2, to the New York State Department of Labor (NYSDOL), and all other applicable agencies having jurisdiction. In addition, the Contractor shall be required to obtain any other permits for work covered under this specification including permits required for air sampling.
- **1.11 TERMINOLOGY:** The following commonly-used terms are defined in the context of these Specifications:
 - A. Asbestos Project: Work that involves the removal, encapsulation, enclosure, repair or disturbance of friable or non-friable asbestos, or any handling of asbestos material that may result in the release of asbestos fibers. For the purpose of compliance with this Part, an asbestos project shall include any disturbance of asbestos fibers, and the planning, asbestos survey (as per Subpart 56-5.1), design, background air sampling, inspection, air sampling and oversight of abatement work, cleanup, and the handling of all asbestos material subject to abatement, as well as the supervising of such activities. Installation of friable ACM shall also be considered an asbestos project. An asbestos project starts with Phase I when the planning, asbestos survey, and design work begins or is required to begin. The project shall not be considered completed until Phase II D is complete.
 - B. Asbestos-Containing Material (ACM): Any material or product which contains more than 1 percent asbestos.
 - C. Aggressive Air Sampling: Air monitoring samples collected while a leaf blower, fans, or other such devices are used to generate air turbulence within the work area.
 - D. Air Filtration Device (AFD) A portable local exhaust system equipped with HEPA filtration, capable of maintaining a constant low velocity air flow into contaminated areas from adjacent, uncontaminated areas and capable of maintaining a negative air pressure with respect to the adjacent, uncontaminated areas.

- E. Air Lock: A system for permitting ingress or egress to the work area while permitting minimal air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways placed a minimum of three feet apart.
- F. Air Monitoring: The process of measuring the fiber content of a specific volume of air in a stated period of time. Personal air sampling results shall be calculated to reflect the employee's eight-hour time weighted average (TWA) exposure. Area sampling results are reported directly, without calculating the TWA.
- G. Amended Water: Water to which a surfactant has been added.
- H. Asbestos Removal Encapsulant: A chemical solution used in place of amended water during asbestos removal to penetrate, bind, and encapsulate the asbestos-containing material.
- I. Authorized Visitor: Dobbs Ferry Union Free School District Environmental Consultant or representatives of any regulatory or other agency having jurisdiction over the project.
- J. Dobbs Ferry Union Free School District Environmental Consultant: Dobbs Ferry Union Free School District agent who is authorized to exercise general contract administration and industrial hygiene inspection of the work.
- K. Certified Industrial Hygienist (CIH): One certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.
- L. Class II asbestos work: Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Class I asbestos work includes the removal of thermal system or surfacing materials.
- M. Competent Person: Definition and responsibilities as set down in 29 CFR 1926.1101(b) and as outlined herein.
- N. Curtained Doorway: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- O. Decontamination Enclosure System: A series of connected rooms for the decontamination of workers (a Personnel Decontamination Enclosure System) or of materials and equipment (Equipment Decontamination Enclosure System).

- P. Equipment Decontamination Enclosure System: A decontamination system for waste materials and equipment, typically consisting of a designated area of the work area, a washroom, and a holding area, with an air lock between any two adjacent rooms and a curtained doorway between the holding area and the non-work area. Not to be used for personnel entry/exit.
- Q. Encapsulant (Sealant): A liquid material which can be applied to ACM and which controls the possible release of asbestos fibers from the material, either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).
- R. Encapsulation: Application of an encapsulant to asbestos-containing building materials to control the possible release of asbestos fibers into the ambient air.
- S. Enclosure: Procedures necessary to completely enclose ACM behind air-tight, impermeable, permanent barriers.
- T. Excursion Limit (EL): The EL is an airborne concentration of asbestos to which no employee shall be exposed when not using respiratory protection. The EL is 1.0 f/cc as averaged over a 30 minute period.
- U. Fixed Object: A unit of equipment or furniture in the work area which cannot be removed from the work area.
- V. Friable: Any material which, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure, or is capable of being released into the air by hand pressure.
- W. Full Facepiece High Efficiency Respirator (FFHER): A respirator which covers the wearer's entire face from the hairline to below the chin and which is equipped with a HEPA filter.
- X. Half Mask High Efficiency Respirator (HMHER): A respirator which covers one-half of the wearer's face, from the bridge of the nose to below the chin, and is equipped with HEPA filters.
- Y. HEPA Filter: A high efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97 percent of the fibers of 0.3 micrometer or larger in diameter.
- Z. HEPA Vacuum Equipment: High efficiency particulate air (HEPA) filtered vacuuming equipment having a UL 586 filter system capable of collecting and retaining asbestos fibers.

- AA. Large Asbestos Project: Large asbestos project shall mean an asbestos project involving the disturbance, enclosure, encapsulation, repair or handling of 160 square feet or more of ACM, PACM or asbestos material or 260 linear feet or more of ACM, PACM or asbestos material.
- AB. Lockdown: Procedure of applying an encapsulant as a protective coating or sealant to a surface from which ACM has been removed in order to control and minimize airborne asbestos fiber generation that might result from residual asbestos-containing debris.
- AC. Minor Asbestos Project: Minor project shall mean an asbestos project involving the disturbance, enclosure, encapsulation, repair or handling of 10 square feet or less of ACM, PACM or asbestos material or 25 linear feet or less of ACM, PACM or asbestos material.
- AD. Movable Object: A unit of equipment or furniture which can be removed from the work area.
- AE. Plasticize: To cover floors and walls with plastic sheeting as herein specified.
- AF. Permissible Exposure Limit (PEL): The PEL is an airborne concentration of ACM to which no employee shall be exposed when not using respiratory protection. The OSHA PEL is 0.1 f/cc expressed on an 8-hour time weighted average (TWA).
- AG. Personnel Decontamination Enclosure System: A decontamination system for personnel and limited equipment, typically consisting of an equipment room, shower room, and clean room, with an air lock between any two adjacent rooms, and a curtained doorway between the equipment room and the work area, and a curtained doorway between the clean room and the non-work area. The decontamination system serves as the only entrance/exit for the work area.
- AH. Powered Air Purifying Respirator (PAPR): Either a full face-piece, helmet, or hooded respirator that powers breathing air to the wearer after the air has been purified through a HEPA filter.
- AI. Regulated Abatement Work Area: The portion of the restricted area where abatement work actually occurs. For tent work areas, the interior of each tent is a regulated abatement work area. For OSHA Class I and Class II asbestos abatement, the interior of the restricted area containment enclosure is the regulated abatement work area. For exterior non-friable asbestos abatement conducted without the establishment of negative air ventilation systems or containment enclosures, the entire restricted area surrounding the abatement location is considered to be the regulated abatement work area.

- AJ. Removal: The act of removing and transporting asbestos-containing or asbestos-contaminated materials from the work area to a suitable disposal site.
- AK. Small Asbestos Project: Small asbestos project shall mean an asbestos project involving the removal, disturbance, repair, encapsulation enclosure or handling of more than 10 and less than 160 square feet of ACM, PACM or asbestos material or more than 25 and less than 260 linear feet of ACM, PACM or asbestos material.
- AL. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
- AM Tent Procedure: A fire retardant polyethylene enclosure that includes walls, ceiling and a floor as required to remove ACM, PACM or asbestos material.
- AN. Type C Respirator: A respirator which supplies air to the wearer from a source outside the work area by means of a compressor.
- AO. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water or asbestos removal encapsulant and by afterwards disposing of these cleaning tools as asbestos-contaminated waste.
- AP. Work Area: Designated rooms, spaces, or areas of the project where asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area has been sealed, plasticized, and equipped with an airlock entrance or a decontamination enclosure system. A non-contained work area is an isolated or controlled-access area which has not been plasticized.

1.12 **REQUIREMENTS AND QUALIFICATIONS:**

- A. Minimum Experience: The Contractor shall have experience with abatement work, as evidenced through participation in at least *two* asbestos abatement projects of complexity comparable to this project.
- B. Experience and Training: The Contractor's job supervisors, foremen, and workers shall be adequately trained and knowledgeable in the field of asbestos abatement. All personnel engaged in asbestos abatement or related activities shall have New York State DOL certifications. All phases of the work shall be executed by skilled craftsmen experienced in each respective trade. Proof of such experience shall be submitted upon request by the Dobbs Ferry Union Free School District. Improperly trained, untrained, or inexperienced personnel shall not be allowed in

the work area(s). Personnel shall meet minimum training and experience requirements outlined in this Section.

- 1. The Contractor's on-site job supervisor shall have successfully completed, within the last twelve months, the NYSDOH-approved course "Supervision of Asbestos Abatement Projects", and shall be qualified as a NYSDOL-certified Contractor/Supervisor. Course must be provided by an NYSDOH-approved training provider. The supervisor shall have experience with abatement work, as evidenced through participation in at least two asbestos abatement projects of complexity comparable to this project.
- 2. The job supervisors and foremen shall be thoroughly familiar with and experienced in asbestos removal and related work and shall meet the requirements of a competent person set down in OSHA Standard 29 CFR 1926.1101.
- 3. All asbestos abatement workers shall be knowledgeable, qualified, and trained in the removal, handling, and disposal of asbestos material and in subsequent cleaning of the affected environment. All asbestos abatement workers shall be certified as having attended and satisfactorily completed asbestos worker training in accordance with OSHA Standard 29 CFR 1926.1101(k)(3). Course must be provided by an NYSDOH-approved training provider.
- 4. The Contractor's job supervisors, foremen, and asbestos abatement workers shall be certified and licensed as required by the NYSDOL.
- 5. Prior to commencement of work, all personnel who are to enter the work area shall be instructed in and shall be knowledgeable of the appropriate procedures for personnel protection and asbestos abatement. On-site training in the use of equipment and facilities unique to this job site shall be performed. Emergency evacuation procedures from the work area shall also be included in worker training.
- C. Supervision Requirements: The Contractor shall provide adequate job supervision for all phases of the asbestos abatement work.
 - 1. The Contractor shall have a NYSDOL job supervisor present on site whenever work described in this Section is in progress. If the job supervisor leaves the site for any reason a qualified and certified supervisor, who meets the requirements of this Section and is familiar with the current status of the work, shall be designated. Dobbs Ferry Union Free School District Designated Representative shall be informed of the substitution. The supervisor must be familiar and experienced with asbestos removal and its related work, safety procedures, and equipment.

- D. Worker Medical Examinations: The Contractor shall provide medical examinations for all employees engaged in asbestos removal and disposal operations, in accordance with OSHA Standards 29 CFR 1910.134(b), 1926.1101, and applicable state regulations. The Contractor shall ensure that all employee examination results are on file in his office and available for review and are maintained in accordance with OSHA Standard 29 CFR 1926.1101 (n) (3).
- E. Certificate of Worker's Release: Each asbestos abatement worker, workers of other trades, or any supervisory personnel who enter the work area, or otherwise contact ACM, shall submit a Certificate of Worker's Release, as required in the Section "Submittal".

1.13 TESTING AND INSPECTION REQUIREMENTS AND RESPONSIBILITIES:

Visual inspections and air monitoring will be performed before, during, and after asbestos abatement (as required, based on removal method(s) being used) to document airborne asbestos fiber concentrations as defined in this specification.

- A. Dobbs Ferry Union Free School District Responsibilities:
 - 1. Dobbs Ferry Union Free School District will employ an Environmental Consultant to perform Project Monitoring and air testing. The project monitor will have the authority to approve the contractor's work, stop the contractor's work and direct the contractor to take corrective actions where required.
 - 2. Area air samples will be collected and analyzed using NIOSH Method 7400. Air samples will be collected during each shift as required by the regulations.
 - 3. Clearance testing by Transmission electron microscopy (TEM) will be conducted as per AHERA regulations. Air samples will be collected to demonstrate final re-occupancy clearance for work areas within the building. The fiber concentration must comply with the specified clearance level as per AHERA and this specification. Dobbs Ferry Union Free School District will provide for collection and analysis of one round of samples required to demonstrate clearance in each discrete work area.
 - 4. Dobbs Ferry Union Free School District Environmental Consultant will perform inspections of the work area, as specified, upon request of the Contractor.

B. Contractor's Responsibilities:

1. TEM air samples which fail to meet the re-occupancy clearance standard shall be paid for by the Contractor. Should a delay occur, due to failure(s)

of clearance air testing, all associated expenses such as TEM analysis, and the Environmental Consultant's time for additional cleaning and air testing, shall be paid by the asbestos contractor. If results of the inside work area group of air samples are unsatisfactory, recleaning of regulated abatement work area surfaces using wet methods, followed by another drying time period and then collection and analysis of an additional set (both inside and outside work area samples) of clearance air samples is required. If only the results of the outside work area group of air samples is unsatisfactory, clean-up of surfaces outside of the regulated abatement work area using HEPA-vacuums and wet-cleaning methods shall be performed prior to collection and analysis of an additional group of outside work area clearance air samples as required by ICR 56 Section 56-9.2. This recleaning/clean-up and sampling process shall be repeated until satisfactory clearance air sampling results have been achieved for all asbestos project non-exempt regulated abatement work areas throughout the entire work site.

- 2. The Contractor, at his/her expense, shall provide OSHA monitoring and all other all tests required by specified applicable regulations, codes, and standards and any other tests for his/her use. The use of a testing laboratory by Dobbs Ferry Union Free School District does not release the Contractor from providing tests required for the protection and safety of his/her employees.
- 3. The Contractor shall employ an independent testing laboratory for analysis of OSHA personal air monitoring samples. The laboratory used for air sample analysis shall be successfully participating in the "Proficiency Analytical Testing (PAT) Program for Laboratory Quality Control for Asbestos." The monitoring shall be supervised by an Industrial Hygienist certified by the American Board of Industrial Hygiene (A.B.I.H.). Each testing laboratory shall be ELAP (Environmental Laboratory Accreditation Program) and NVLAP (National Voluntary Laboratory Accreditation Program) certified. Dobbs Ferry Union Free School District shall approve the contractor's testing laboratory.
- 4. From each work area the Contractor, at his/her expense, shall collect and analyze OSHA personal air monitoring samples. Sampling shall be repeated during each different work activity. Sample collection and analysis shall be performed using the OSHA Reference Method as outlined in 29 CFR 1926.1101, Appendix A.
- 5. Results of all air monitoring performed by the Contractor shall be posted within 24 hours for regular abatement project after collection for all workers to see. A copy of the results shall be given to the Dobbs Ferry Union Free School District Environmental Consultant at the same time.

- 5. The Contractor shall be advised whenever questions arise concerning compliance with standards of quality and completeness of the work, and shall use his/her best efforts to resolve any such questions to the satisfaction of the Dobbs Ferry Union Free School District Environmental Consultant.
- 6. Where air monitoring tests and/or inspections are specified, the Contractor shall notify Dobbs Ferry Union Free School District Environmental Consultant, in writing, 24 hours, in advance of the required test and/or inspection.
- 8. The Contractor is responsible for ensuring the Work is complete to the level that meets the criteria of the inspection. The Contractor shall perform an inspection of the Work to evaluate completeness prior to requesting an inspection by the W Dobbs Ferry Union Free School District Environmental Consultant.
- C. Time Requirements for Dobbs Ferry Union Free School District Environmental Consultant's Inspections and Testing: Where visual inspections or air testing is required to be performed by the Dobbs Ferry Union Free School District Environmental Consultant, the Contractor shall allow for the following response/analytical time for completion of the inspection/test.
 - 1. Where visual inspections are required, allow 24 hours, beginning from the time the Contractor's request is received by the Dobbs Ferry Union Free School District Environmental Consultant, for the performance of the inspection.
 - 2. Where TEM clearance air monitoring tests are required, allow 24 hours, beginning from the time the Contractor's written request is received by the Dobbs Ferry Union Free School District Environmental Consultant, to the beginning of the air test.

PART 2 - PRODUCTS

MATERIALS: Materials provided under this section shall be standard products of manufacturers regularly engaged in the production of the items and shall conform to OSHA Standard 29 CFR 1926.1101; EPA Standard 40 CFR 61, Subpart M; Department of Transportation Standards 49 CFR 171, 172, and 173; applicable state regulations; and requirements specified herein. Materials listed under this section "or equal" shall be provided for work under contract.

- A. Plastic: Provide fire retardant plastic of 6-mil thickness shall be provided in rolls of sizes which will minimize the frequency of joints. Fire retardant plastic sheet shall be used for plasticizing the enclosed work area, for preparation of the decontamination enclosure system, and for waste packaging.
- B. Reinforced Fire Retardant Plastic: Provide reinforced polyethylene sheet for the floor area of the decontamination enclosure system. Reinforced plastic sheet provided for this project shall be a 19 mil, 3-ply, high density flame resistant-reinforced-polyethylene sheet. Plastic color shall be opaque.
- C. Duct Tape: Duct tape shall be capable of sealing joints of adjacent sheets of plastic and of attaching plastic sheeting to finished surfaces without damage to existing finish and shall be capable of adhering under both dry and wet conditions, including use of amended water
- D. Surfactant: Surfactant (Wetting Agent) shall consist of resin materials in a water base, which have been tested to ensure materials are non-toxic and non-hazardous. Surfactants shall be installed according to the manufacturer's written instructions.
- E. Lockdown Encapsulants: Encapsulants used after asbestos removal to lockdown fugitive fibers shall carry a Class "A" fire resistance rating and shall have an ASTM E-162 flame spread index of 15 or less. A tint shall be given to the encapsulant by means of the addition of non-toxic, nonflammable colorings before application. The encapsulant shall be installed according to the manufacturer's written instructions.
- F. Caulking Sealant: Caulking sealant shall be single component, non-sag elastomer with 1600% elongation capacity. Sealant shall meet the requirements of Federal Specification TT-S-00230C, Class A Type II. Sealant shall be used to form an airtight seal around plywood barriers or temporary partitions, to seal along the seams of the decontamination enclosure system's plywood sheathing, and to seal around piping or other small penetrations of the work area. Sealant application shall be according to the manufactures written instructions.

- G. Foam Sealant: Foam Sealant shall be expanding urethane Class 1 foam sealant with an Underwriters Laboratories, Inc. (U.L. 723) flame spread index of 25 or less, smoke developed index of 0, and a minimum operating temperature range between -30°F and 250°F.
- H. Plywood: Plywood used for temporary partitions, decontamination enclosure systems, and tunnels shall be an exterior grade and a minimum 3/8-inch thick.
- I. Spray Adhesive: Spray Aerosol Adhesive shall be specially formulated to stick to sheet polyethylene (3M 76, 3M 77, or equivalent).
- J. Other Materials: All other materials, such as lumber, plywood, tools, scrapers, brushes, cleaning materials, adhesive, nails, hardware, etc., which are required to perform the work described in this Section shall be provided. Materials and equipment shall be new or used, uncontaminated by asbestos, in serviceable condition, and appropriate for the intended purpose.
- K. Disposal Bags: Plastic Disposal Bags shall be a minimum of six mils in thickness. Bags shall be labeled in accordance with this Section.
- L. Shipping Containers: Impermeable Containers shall be suitable to receive and retain any asbestos-containing or asbestos-contaminated materials until they are disposed of at an approved landfill. The containers shall be labeled in accordance with this Section. Containers shall be both airtight and watertight and conform to DOT Standard 49 CFR 178.224. Each container shall be constructed of fiber, hard plastic, or metal, with locking, airtight lids.
- M. Markings and Labels: Disposal bags and shipping containers shall bear danger labels, transportation packaging labels, and generator identification information. Labels shall be permanently affixed to all bags and shipping containers containing ACM, in accordance with OSHA Standard 29 CFR 1926.1101(k)(2), DOT Standard 49 CFR Part 171 and 172, and EPA Standard 40 CFR Part 61.150(a)(1)(v).
 - 1. Danger label format and color shall conform to OSHA Standard 29 CFR 1926.200. Danger labels shall display the following legend/information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG
DISEASE HAZARD

- 2. DOT Marking and Labels: Markings and labels shall be permanently affixed to all bags and containers containing ACM, in accordance with DOT 49 CFR 172.304 and 172.407.
 - a. Markings shall display the following text:

RQ, ASBESTOS, NA 2212

- b. Labels shall be diamond shape and shall be located near the Marking text. Labels will consist of a diamond a minimum of 100 millimeters (mm) on each side with each side having a solid line inner boarder 5.0 to 6.3 mm from the edge. The label shall be white with seven black vertical stripes on the top half. Black stripes and white spaces shall be equally spaced. The lower half of the label shall be white with the class number "9" underlined and centered at the bottom. Refer to DOT 40 172.446 for label format.
- 3. Generator identification information shall be affixed to each DOT label format and color shall conform to DOT Standard 49 CFR 172.304. Generator identification information labels shall display the following legend/information:

GENERATOR'S NAME GENERATOR'S 24 HOUR PHONE GENERATOR'S FACILITY ADDRESS

N. Reuse of Containers: If impermeable containers used to transport bagged asbestos waste to the landfill are to be reused, the empty containers shall display the following label:

RESIDUE: LAST CONTAINED ASBESTOS RQ

O. Warning Signs: Warning Signs shall be posted at the perimeter of the work area prior to abatement operations in accordance with OSHA Standard 29 CFR 1926.1101. Danger sign format and color shall conform to OSHA Standard 29 CFR 1926.200. The signs shall display the legend indicated below:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN THIS AREA

- P. Mastic remover. The contractor shall use an odorless mastic remover. Manufacture and brand of mastic remover shall be approved by the Facility prior to commencing removal work.
- **EQUIPMENT:** Equipment provided under this section shall conform to applicable federal and state regulations, local codes, and the requirements specified herein.
 - A. Spraying Equipment: Equipment used to apply amended water or removal encapsulant shall be of a low pressure type to prevent disturbance of the asbestos prior to physical controlled removal. Airless spray equipment shall be provided for the application of asbestos encapsulant.
 - B. Vehicles: Trucks or Vans used for the transportation of asbestos waste shall be enclosed and suitable for loading, temporary storage, transit, and unloading of asbestos-contaminated waste without exposure to persons or property.
 - C. Fall Protection Equipment: Certified and approved equipment to be used by trained personnel when working at elevation to protect against falling from an elevated work area.
 - D. Fire Extinguisher: Type "ABC" dry chemical extinguisher or a combination of several extinguisher of NFPA recommended types for the fire hazard exposures in each extinguisher location shall be provided. Minimum size of extinguisher shall be 4-A, and 40-B:C. Supply a minimum of one extinguisher for every 1,000 square feet of floor area, with a maximum travel distance to an extinguisher of 75-feet. Supply at least one extinguisher in each decontamination enclosure equipment room, and clean room. Supply 2 additional extinguishers inside the work area
 - E. Smoke Detectors: Smoke detectors of the battery powered ionization type will be required at a rate of one per 5,000 square feet, with a minimum of one smoke detector in the decontamination enclosure clean room, and one in the work area.
 - F. Water Filtration System: A system capable of filtering and retaining particles larger than 5.0 microns in size shall be provided.
 - G. Carts: Provide water tight wheeled carts with tight fitting lids suitable for movement of non-contaminated waste or bagged asbestos waste from the decontamination enclosure system to the waste storage container or transport vehicle.
 - H. Power Tools: Provide power tools necessary to complete the Work. Power tools used directly for asbestos removal shall be equipped with a dust collection system. Attach a shroud connected to a HEPA vacuum system for capture of dust.

- **2.03 WORKER PROTECTIVE CLOTHING AND EQUIPMENT:** Protective clothing and equipment shall conform to OSHA Standard 29 CFR 1926.1101
 - A. Protective Clothing: Workers shall be provided with sufficient sets of properly fitting, full-body, disposable coveralls, head covers, gloves, and 18-inch high boot-type foot covers. Disposable coveralls, head covers, and 18-inch high boot-type foot covers shall be constructed of material equal to DuPont "TYVEK-Type 14" or Kimberly-Clark "Kleenguard", as a minimum requirement.
 - 1. The Contractor shall provide authorized visitors and the Dobbs Ferry Union Free School District Environmental Consultant suitable properly fitting protective disposable clothing, headgear, hard hats, eye protection, respiratory protection, and footwear (up to four sets per 8-hour shift) whenever they are required to enter the work area.
 - B. Equipment: Eye protection and hard hats required for job conditions or by applicable safety regulations shall be provided.
 - C. Respiratory Protection: The Contractor shall be solely responsible for providing adequate respiratory protection at all times for all individuals in the work area. Types of respirators used shall be approved by MSHA/NIOSH for asbestos in accordance with OSHA Standard 29 CFR 1926.1101 and 29 CFR 1910.134. The Contractor shall provide a level of respiratory protection which supplies an airborne fiber level inside the respirator below 0.01 fibers per cubic centimeter (f/cc), as the minimum level of protection allowed. Determine the proper level of protection by dividing the actual airborne fiber count in the work area by the "protection factors" given below for each respirator type:

Respirator Type	<u>Protection Factor</u>
Air purifying: Negative-pressure respirator, High efficiency HEPA filter, Half-facepiece	10
Air purifying: Negative-pressure respirator, High efficiency HEPA filter, Full-Facepiece	50 (quantitative)
Powered air purifying (PAPR): Positive pressure respirator High efficiency HEPA filter, Full-facepiece	1000
Type C supplied air:	1000

DOBBS FERRY UNION FREE SCHOOL DISTRICT DOBBS FERRY SPRINGHURST ES

Positive-pressure respirator, Pressure-demand, Full-facepiece HEPA escape

Type C supplied air: 1000
Positive-pressure respirator,
Pressure-demand,
Full-facepiece
HEPA escape

Type C supplied air: 1000
Pressure-demand,
Full-facepiece
equipped with an auxiliary SCBA

- 1. The Contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the work area(s), as specified in OSHA Standard 29 CFR 1926.1101, and as more stringently specified otherwise, herein.
- 2. During the use of supplied air systems the Contractor shall provide authorized visitors, Dobbs Ferry Union Free School District Environmental Consultant, and the testing laboratory representative with individually issued and marked respiratory equipment (up to six units). Respiratory equipment shall be compatible with the supplied air system in use, and shall be suitable for the asbestos exposure level(s) in the work area(s), as specified in OSHA Standard 29 CFR 1926.1101, and as more stringently specified otherwise, herein.
- 3. Where respirators with disposable filter parts are employed, the Contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation.
- 4. Breathing air supply systems shall conform to the USEPA NIOSH Document EPA-560-OPTS-86-001 (September 1986) entitled "A Guide to Respiratory Protection for the Asbestos Abatement Industry."
- 5. The Contractor shall have a minimum of two spare air hoses with connectors to permit the Dobbs Ferry Union Free School District Environmental Consultant or testing laboratory's representative to connect his/her assigned Type C respirator to the air system at <u>any time</u> without having to wait for personnel to exit the work area in order to obtain a spare hose.

PART 3 - EXECUTION

3.01 <u>DECONTAMINATION ENCLOSURE SYSTEMS</u>:

- A. Personal decontamination system enclosures shall be constructed and functional prior to commencing the regulated abatement work area preparation activities. Waste decontamination system enclosures shall be constructed and functional at the completion of preparation activities. After installation of the personal decontamination system enclosure, all access to the regulated abatement work area shall be via the installed personal decontamination system enclosure.
- B. Personal Decontamination System Enclosure Large Project.
 - Enclosure General. A personal decontamination system enclosure shall 1. be provided outside the regulated abatement work area and in close proximity to all locations where personnel shall enter or exit the regulated abatement work area. One personal decontamination enclosure system for each regulated abatement work area shall be required. This system may lighting sources adequate existing separate from decontamination system enclosure, or shall be supplied with a GFCI protected temporary lighting system. The personal decontamination system enclosure shall be sized to accommodate the number of workers and equipment required for the intended purpose. Such system may consist of existing attached rooms outside of the regulated abatement work area, if the layout is appropriate, that can be plasticized and are accessible from the regulated abatement work area. When this situation does not exist, personal decontamination enclosure systems may be constructed of metal, wood or plastic supports covered with fire-retardant plastic sheeting. A minimum of one (1) layer of six (6) mil fire-retardant plastic sheeting shall be installed on the ceiling, and walls of the enclosure system. At least two (2) layers of six (6) mil fire-retardant reinforced plastic sheeting shall be used for flooring protection of this area. This system must be kept clean, sanitary and climate controlled at all times in conformance with all federal, state and local government requirements. This system shall remain on-site, operational and be used until completion of Phase II C of the asbestos project.
 - 2. Rooms and Configuration. The personal decontamination system enclosure shall consist of a clean room, a shower room and an equipment room connected in series but separated from each other by airlocks. There shall be a curtained doorway separation between the equipment room and the regulated abatement work area, and there shall be a lockable door to the outside. (See Figure 1 within ICR 56) Minimum dimensions for each airlock, shower room and equipment room shall be three (3) feet wide by six (6) feet in height, to allow for adequate access to and from the regulated abatement work area.

- 3. Curtained Doorway. An assembly which consists of at least three (3) overlapping sheets of six (6) mil fire retardant plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to insure that the sheets hang straight and maintain a seal over the doorway when not in use.
- 4. Framing. Enclosures systems accessible to the public shall be fully framed, hard-wall sheathed and utilize a lockable door for safety and security.
- 5. Sheathing. A plywood or oriented strand board (OSB) sheathing material of at least 3/8-inch thickness.
- 6. Plastic Sheeting. Enclosure systems constructed at the work site shall use at least one (1) layer of six (6) mil fire-retardant plastic sheeting on walls and ceiling. At least two (2) layers of six (6) mil fire-retardant reinforced plastic sheeting shall be used for floor protection of this area.
- 7. Prefabricated or Trailer Units. A completely watertight fiberglass or marine painted prefabricated unit does not require plasticizing. Rooms shall be configured as per paragraph (2) of this Section. All prefabricated or trailer decontamination units shall be kept in good condition, and shall be completely decontaminated after final cleaning and immediately prior to clearance air sampling. Upon receiving satisfactory clearance air results, the prefabricated units shall be sealed then separated from the regulated abatement work area and removed from the site.
- Clean Room. The clean room shall be sized to accommodate a full 8. workshift of asbestos abatement contractor personnel, as well as the air sampling technician and the project monitor. The clean room shall be a minimum of six (6) feet in height. A minimum of thirty-two (32) square feet of floor space shall be provided for every six (6) full shift abatement workers, calculated on the basis of the largest work shift. If the largest work shift consists of three (3) or less full shift abatement workers, the minimum clean room size requirement is reduced to twenty-four (24) square feet of floor space. Benches, lockers and hooks shall be provided for street clothes. Shelves for storing respirators shall be provided. Clean clothing, replacement filters for respirators, towels and other necessary items shall be provided. The clean room shall not be used for storage of tools, equipment or materials. It shall not be used for office space. A lockable door shall be provided to permit access to the clean room from outside the regulated abatement work area or enclosure and shall be used to secure the regulated abatement work area and decontamination enclosure during non-work hours.
- 9. Shower Room. The shower room shall contain one (1) shower per every six (6) full shift abatement workers, calculated on the basis of the largest work shift. Multiple showers shall be simultaneously accessible (installed in parallel) to certified personnel. Each showerhead shall be supplied with hot and cold water adjustable at the tap. The shower enclosure shall be

constructed to ensure against leakage of any kind. Uncontaminated soap, shampoo and towels shall be available at all times. Shower water shall be drained, collected and filtered through a system with at least 5.0-micron particle size collection capability. Submersible pumps shall be installed, maintained and utilized in accordance with pertinent OSHA regulations and manufacturer's recommendations. A multi-stage filtering system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filtering system by larger particles. Filtered wastewater shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestoscontaminated waste.

- 10. Equipment Room. The equipment room shall be used for the storage of decontaminated equipment and tools. A one (1) day supply of replacement filters for HEPA-vacuums and negative pressure ventilation equipment in sealed containers, extra tools, containers of surfactant and other materials and equipment that may be required during the abatement project may also be stored here. A container lined with a labeled, at least six (6) mil plastic bag for collection of clothing shall be located in this room. Contaminated footwear and work clothes shall be stored in this area.
- 11. Airlocks. Airlock construction shall consist of two (2) curtained doorways with three (3) alternating six (6) mil fire retardant polyethylene curtains per doorway, separated by a distance of at least three (3) feet, such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the next doorway. Minimum airlock size shall be three (3) feet wide, by three (3) feet long, by six (6) feet in height.

C. Personal Decontamination System Enclosure - Small Project

- 1. Enclosure Requirements. A personal decontamination system enclosure for a Small asbestos project shall consist of, at a minimum, an equipment room, a shower room and a clean room separated from each other and from the regulated abatement work area and other areas by curtained doorways as defined in ICR 56 Section 56-2.1. All other provisions for personal decontamination system for a Large asbestos project shall apply. Equipment storage, personal gross decontamination and removal of clothing shall occur in the equipment room just prior to entering the shower. (See Figure 4 in the ICR 56) The full personal decontamination system enclosure specified for Large asbestos projects is recommended.
- D. Remote Personal Decontamination System Enclosure. If a personal decontamination system cannot be attached to the regulated abatement work area, due to available space restrictions or other building and fire code restrictions, a remote personal decontamination system enclosure may be used for limited Special Projects as per subpart 56-11, negative pressure tent enclosure

work areas with glovebag only abatement, or if non-friable ACM is being removed in a manner which will not render the ACM friable.

Limitation. If it is found during removal, that the non-friable ACM or asbestos material will become friable during the removal process, and it is logistically possible to attach the decontamination system enclosure, abatement work must stop immediately while the remote personal decontamination system is relocated to be attached and contiguous to the regulated abatement work area.

The following requirements apply for all remote personal decontamination systems:

- 1. Protective Clothing. Workers shall don two (2) sets of disposable protective clothing and a supply of protective clothing shall be kept in the airlocks attached to the regulated abatement work area.
- 2. Location. The remote personal decontamination system shall be constructed as close to the regulated abatement work area as physically possible. If the remote personal decontamination system must be located at the exterior of the building/structure due to space or code restrictions, it shall be constructed within fifty (50) feet of the building/structure exit used for access by the asbestos abatement contractor personnel. The decontamination unit shall be cordoned off at a distance of twenty-five (25) feet to separate it from public areas.
- 3. Airlocks. At a minimum, two (2) extra airlocks as defined in ICR 56 Section 56-2.1 shall be constructed as per ICR 56 Section 56-7.5(b)(11). One shall be constructed at the entrance to the equipment room or equipment/washroom. The other extra airlock shall be constructed at the entrance to the containment or regulated abatement work area(s). These airlocks shall have lockable doorways at the entrance to the airlock from uncontaminated areas. These airlocks shall be cordoned off at a distance of twenty-five (25) feet and appropriately signed in accordance with ICR 56 Section 56-7.4(c). Airlocks shall not be used as a waste decontamination area and shall be kept clean and free of asbestos containing material.
- 4. Designated Pathway. The walkway from the regulated abatement work area to the personal decontamination system or next regulated abatement work area shall be cordoned off and signage installed as per ICR 56 Section 56-7.4(c), to delineate it from public areas while in use during Phase IIA through IID.
- 5. Travel Through Uncontaminated Areas. If at any time a worker must travel through an uncontaminated area to access the personal decontamination area, the worker shall HEPA-vacuum and/or wet wipe his/her outer protective clothing while in the regulated abatement work area, then proceed into the airlock, which serves as a changing area, where he/she shall remove the outer clothing and don a clean set of protective clothing. The worker may then proceed to the personal decontamination system enclosure only along a designated pathway as described above. Travel in any other area shall not be allowed.

- 6. Removal. The remote personal decontamination unit shall be removed only after satisfactory clearance air sampling results have been achieved.
- E. Waste Decontamination System Enclosure Large and Small Asbestos Projects.
 - 1. Enclosure – General. A waste decontamination system enclosure shall be provided outside the regulated abatement work area and shall be attached to the regulated abatement work area. One (1) waste decontamination enclosure for each regulated abatement work area shall be required. This system may utilize adequate existing lighting sources separate from the decontamination system enclosure, or shall be supplied with a GFCI protected temporary lighting system. The waste decontamination system enclosure shall be sized to accommodate the number of workers and equipment for the intended purpose. Such system may consist of existing attached rooms outside of the regulated abatement work area, if the layout is appropriate, that can be plasticized and are accessible from the regulated abatement work area. When this situation does not exist, enclosure systems may be constructed of metal, wood or plastic supports covered with fire-retardant plastic sheeting. A minimum of one (1) layer of six (6) mil fire-retardant plastic sheeting shall be installed on the ceiling, and walls of the enclosure system. At least two (2) layers of six (6) mil fireretardant reinforced plastic sheeting shall be used for flooring protection of this area. This system must be kept clean, sanitary and climate controlled at all times in conformance to all federal, state and local government requirements. This system shall remain and be used until completion of Phase II C of the asbestos project.
 - 2. Rooms and Configuration. A waste decontamination system enclosure shall consist of a washroom and a holding area connected in series but separated from each other by an airlock. There shall be a lockable door to the outside, and there shall be a curtained doorway between the washroom and the regulated abatement work area. (See Figure 2 in the ICR 56)
 - 3. Curtained Doorway. An assembly which consists of at least three (3) overlapping sheets of six (6) mil fire retardant plastic over an existing or temporarily framed doorway. One (1) sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to insure that the sheets hang straight and maintain a seal over the doorway when not in use.
 - 4. Washroom. A room/chamber between the regulated abatement work area and the holding area in the waste decontamination system enclosure, where equipment and waste containers are wet cleaned or HEPA-vacuumed. Adequate drainage and bag/container wash water shall be provided within the room/chamber, as well as a sufficient quantity of clean waste bags/containers.
 - 5. Equipment/Washroom Alternative. Where there is only one (1) exit from the regulated abatement work area, the holding area of the waste

- decontamination system enclosure may branch off from the equipment room of the personal decontamination system enclosure. The equipment room will also be used as a waste washroom. (See Figure 3 in the ICR 56)
- 6. Plastic Sheeting. Waste decontamination system enclosures constructed at the work site shall use at least one (1) layer of six (6) mil fire-retardant plastic sheeting on walls and ceiling. At least two (2) layers of six (6) mil fire-retardant reinforced plastic sheeting shall be used for flooring protection of these areas.
- 7. Enclosure Security. The waste decontamination system enclosure and regulated abatement work area airlock(s) (when remote decontamination systems are used) shall be constructed with lockable doors to prevent unauthorized entry. Enclosures systems located within twenty-five (25) feet of an area of public access shall be fully framed and hard-wall sheathed for safety.
- 8. Drains. The waste washroom shall be equipped with a wash bin of sufficient size to perform waste container washing operations and shall have a submersible pump installed to collect waste water and deliver it to the shower wastewater filtration system where it shall be filtered in accordance with paragraph (b)(9) of this Section.
- 9. Shower/Washroom Alternative Small Asbestos Project. For Small asbestos projects with only one (1) exit from the regulated abatement work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage, but shall be used for waste transfer to carts, which shall be immediately removed from the enclosure. Waste shall be transferred only during times when the showers are not in use. (See Figure 4 in this Section)
- F. Waste Decontamination System Enclosure When Remote Personal Is Allowed. When a remote personal decontamination system enclosure is allowed and utilized for a regulated abatement work area, the following requirements shall apply:
 - 1. Minor Size Regulated Abatement Work Area. No specific waste decontamination system enclosure is required for minor size regulated abatement work areas. The waste generated shall be immediately bagged/containerized within the regulated abatement work area.
 - 2. Small & Large Size Regulated Abatement Work Areas.
 - a. Washroom. An additional chamber shall be constructed within the regulated abatement work area, attached to the existing airlock used to access the work area. The washroom/airlock combination shall be utilized as the contiguous waste decontamination enclosure for waste bagging/containerization and waste transfer activities. The washroom shall be constructed and supplied with equipment/materials consistent with waste decontamination system

- enclosure washroom requirements for contiguous personal and waste decontamination system enclosures.
- b. Removal. The washroom chamber shall be removed only after satisfactory clearance air sampling results have been achieved.

3.02 PERSONNEL PROTECTION AND DECONTAMINATION PROCEDURES:

- A. General: The Contractor shall take all safety measures and precautions necessary to protect his/her employees and building occupants in accordance with OSHA Standard 29 CFR 1926, EPA Standard 40 CFR, Part 61, Subpart M, and applicable state and city regulations. The Contractor shall be solely responsible for enforcing personnel protection requirements.
 - 1. After the installation of the personal decontamination system, full PPE in compliance with current OSHA regulations shall be worn in regulated abatement work areas during preparation activities, for all friable OSHA Class I or Class II asbestos projects. Asbestos abatement contractor's respirator selection, filter selection, medical surveillance and respiratory training must be consistent with current OSHA regulations. Appropriate respiratory protection is also required of all authorized visitors.
 - 2. Workers or authorized visitors shall not eat, smoke, drink, or chew gum or other substances while in the work area(s) or decontamination area(s).
 - 3. Contaminated worker footwear, eye protection, and hard hats shall be stored in the equipment room when not in use in the work area and, upon completion of asbestos abatement, disposed of as asbestos-contaminated waste or decontaminated for reuse.
 - 4. Entry to the personal and waste decontamination system enclosures shall be restricted to the asbestos contractors involved with the asbestos project, appropriately certified employees of the asbestos contractors, authorized visitors, police, fire and other public safety personnel.
 - 5. Asbestos workers shall not wear any jewelry; e.g. watch, necklace, etc. while in the work area or decontamination area.
- B. Worker Respiratory Protection: With approval from the Dobbs Ferry Union Free School District Environmental Consultant, historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for the time interval prior to the Contractor establishing the eight-hour time weighted average (TWA) for an abatement task. Historical data provided by the Contractor shall be based on OSHA personal air monitoring of the "breathing zone" of his/her employees for other asbestos abatement projects, and the data were obtained during work operations conducted under work place conditions closely

resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations. Documentation of aforementioned results shall be presented to the Dobbs Ferry Union Free School District Environmental Consultant for review of applicability. (See "Submittal, Pre-Project Information." This will not relieve the Contractor in providing personal air monitoring to determine the TWA for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101. After the TWA is established, the Contractor may provide respirators as presented in the Specification. The minimum level of protection for TSI and/or Surfacing Materials abatements is full face-piece Powered Air Purifying Respirator (PAPR).

- 1. Review material safety data sheets (MSDS) for products to be used during the work. Follow recommendations as given by the product manufacturer for personnel protection required to be worn during product application.
- Personal Air Monitoring Requirements: The Contractor's CIH shall be 2. responsible for development and implementation of a personal air monitoring program in accordance with OSHA Standard 29 CFR 1926.1101, good industrial hygiene practices, and the requirements herein. Personal air monitoring shall be performed by an independent testing laboratory and supervised by the Contractor's CIH. Documentation of air sampling shall include as a minimum, calculations of minimum sample volume to achieve necessary detection limits; sampling time; sampling location (or subject); evidence of periodic inspection of sampling equipment; documentation of daily pre- and post-calibration of sampling equipment; detailed description of worker protective devices; description of any typical environmental conditions; and a description of work practices/procedures/controls in operation during the sampling period. Documentation of sample analysis shall include, as a minimum, sample identification; total sample duration, sample flow rate; the "Limit of Reliable Quantification"; total air volume; total fibers counted (with work sheets); total fields counted; blank filter analysis; and reticule field area. Airborne fiber concentrations in fibers per cubic centimeter (f/cc) shall be calculated and reported at the 95 percent confidence level.
- 3. Full-shift personal exposure air sampling of workers shall be performed to establish the 8-hour (TWA) exposure. Such sampling shall be conducted for each employee (or representative group of employees, at least one sample per eight man crew) expected to evidence the highest exposure in each work area for each type of activity on the first shift that site preparation, removal, or cleanup activities occur. Similarly, 30-minute personal exposure air sampling shall be conducted during activities anticipated to produce the highest airborne concentrations to determine the Excursion Limit. Personal exposure sampling shall be repeated everyday as per protocol requirements where removal and cleanup operations are

conducted for the duration of the project, or at any time that conditions indicate to the Contractor or the Contractor's CIH that the most recent personal sampling results are no longer indicative of employee exposure. PCM personal samples shall be collected and analyzed according to the OSHA Reference Method in OSHA Standard 29 CFR 1926.1101, Appendix B.

C. Personnel Entrance and Decontamination Procedures for Non-Friable Flooring and/or Mastic Removal methods:

- 1. All workers and authorized visitors shall enter the work area through the worker decontamination enclosure system.
- All individuals who enter the work area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, contractor(s), the project, each work area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity.
- Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator (with new filters, if appropriate) and clean protective clothing before entering the work area through the shower room and equipment room.
- Each worker or authorized visitor shall, each time he/she leaves the work area: remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the work area is not permitted outside the work area.
- D. Personnel Entrance and Decontamination Procedures for Gross Removal Operations Utilizing Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS removal methods:

- 1. All workers and authorized visitors shall enter the work area through the worker decontamination enclosure system.
- All individuals who enter the work area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, contractor(s), the project, each work area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity.
- Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator (with new filters, if appropriate) and clean protective clothing before entering the work area through the shower room and equipment room.
- Each worker or authorized visitor shall, each time he/she leaves the work area: remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the work area is not permitted outside the work area.
- **3.03 PREPARATION OF WORK AREA:** The following Paragraph "General Preparations" outlines procedures applicable to all work areas. Work procedures specific for preparing each asbestos removal area is addressed in its respective Subparagraph. If a site specific variance is approved, procedures outlined in the variance will supercede this specification.
 - A. **General Preparations:** The following general preparations shall be used for all work areas being abated:
 - 1. Erect barricades; post notices and warning signs.
 - 2. Provide and install decontamination enclosure systems in accordance with Article 3.01, "Decontamination Enclosure Systems" of this Section.
 - 3. Seal drains and other collection devices with 6-mil plastic and plywood, as necessary, and provide a system to collect all water used by the

Contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.

- 4. Ensure that the Contractor's approved Fall Protection Equipment (if applicable) is in place, in operating condition, and in operation during work described in this section.
- 5. Maintain emergency and fire exits from the work areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with florescent paint or other effective designations to permit easy location from anywhere within the work area. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.
- 6. Temporary lighting within the work area and decontamination system shall be provided as required to achieve minimum illumination levels.
- 7. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be equipped by manufacture with HEPA filtered local exhaust ventilation.
- 8. Hot and cold water may not be available in all work areas. In such cases sufficient heating equipment shall be provided to maintain a necessary supply of hot water for showers.

B. Non-friable Flooring and/or Mastic Removal methods:

- 1. Each regulated abatement work area shall be established and signage posted as per the requirements of Section 56-7.4 of NYS DOL 12 NYCRR Part 56. Each regulated abatement work area shall remain vacated except for certified workers until satisfactory clearance air sampling results have been obtained or the asbestos project is complete.
- 2. Regulated abatement work area preparation shall also comply with Sections 56-7.1 through Section 7.10 of NYS DOL 12 NYCRR Part 56, except that six (6) air changes per hour are required within the work area.
- 3. Prior to the placement of critical and isolation barriers, affected surfaces shall be pre-cleaned using HEPA- filtered vacuum equipment and wet cleaning methods. All critical and isolation barriers shall be installed as per Section 56-7.11(a-b) of NYS DOL 12 NYCRR Part 56 and all seams of HVAC or other system components that pass through a regulated abatement work area shall be sealed prior to beginning Phase II B work for each regulated abatement work area on the project. The critical and isolation barriers shall be removed only after satisfactory clearance air sampling results have been obtained.

- 4. Regulated abatement work area preparation shall also comply with Section 7.11(c-d) of NYS DOL 12 NYCRR Part 56.
- 5. The ceiling, walls and floor need not be plasticized as per Section 56-7.11(e) of NYS DOL 12 NYCRR Part 56 for manual or chemical removal methods.
- C. Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS removal methods:
 - 1. The immediate work area shall be considered to be the area from which the asbestos containing materials are actively being removed. The asbestos project regulated abatement work area shall extend twenty-five (25') feet from the perimeter of the immediate work area and shall have signage in accordance with Section 56-7.4 of NYS DOL 12 NYCRR Part 56. An airlock shall be required at the entrance to the regulated abatement work area to serve as a changing area, if the workers shall have to pass through enclosed publicly occupied space, such as from a roof through an interior stairway, to access the decontamination units.
 - a. Where the asbestos project regulated abatement work area extends outward twenty-five (25) feet and extends downward one (1) floor to encompass a passage or vehicular door which must be used for either a primary entrance or by an emergency vehicle, thereby precluding sealing such door, a tunnel structure (with sides and roof) built of plywood sheeting, covered with at least two (2) layers of at least six (6) mil plastic, shall extend outward twenty-five (25) feet horizontally from the line of vertical projection of the roof edge downward to grade level
 - 2. Regulated abatement work area preparation shall also comply with Sections 56-7.2, 7.3, 7.4, 7.5, 7.6, 7.7 and 7.9 of NYS DOL 12 NYCRR Part 56.
 - 3. The personal and waste decontamination system enclosures can be remote but must be within fifty (50) feet of the building/structure entrance used by the asbestos handlers (workers), and shall be removed only after obtaining satisfactory clearance air results for the regulated abatement work area or an acceptable visual inspection has determined that the abatement is complete, as per Section 56-9. 2(e) of NYS DOL 12 NYCRR Part 56.
 - 4. Prior to the placement of critical barriers, affected surfaces shall be precleaned using HEPA-filtered vacuum equipment and wet cleaning methods. All openings within the regulated abatement work area shall be sealed with critical barriers installed as per Section 56- 7.11(a), prior to

beginning Phase II B activity on the project. The critical barriers shall be removed only after satisfactory clearance air sampling results have been obtained or the asbestos project is complete. The requirements of Section 56-7.11(b-e) of NYS DOL 12 NYCRR Part 56 do not apply. Additional requirements are as follows:

Roofs:

All openings (including operable windows, doors, ducts, grilles, communicating openings, etc.) one (1) story above and one (1) story below the roof level of the regulated abatement work area (this includes any building/structure within twenty-five (25) feet of the immediate work area), shall be sealed directly with two (2) layers of at least six (6) mil flame-retardant plastic sheeting. All vent openings which cannot be sealed shall be extended vertically a minimum of eight (8) feet and remain in operation.

A polyethylene drape or curtain may be used instead of plasticizing the windows individually. The drape may be removed after the asbestos project is complete.

The drape or curtain, if used, shall be made of two (2) layers of a continuous eighteen (18) foot curtain (drape) of at least six (6) mil plastic hung from the top of the wall or parapet. The plastic curtain shall be secured using nailer strips and ram set charges or other methods approved by the building/structure owner's authorized representative. The bottom of the plastic curtain shall be sufficiently weighted or anchored to prevent lifting due to winds. Curtain seams shall overlap at least twelve (12) inches and be sealed with duct tape front and back. The curtain ends and each seal shall be reinforced by stapling furring strips to the plastic. The plastic curtain shall extend a minimum of fifteen (15) feet beyond the last opening within twenty-five (25) feet of the regulated abatement work area. When removed, the plastic curtain shall be disposed of as asbestos waste.

Any windows on the floor below or above and within twenty-five (25) feet of the immediate work area need to be plasticized, but if safety reasons dictate, they may be plasticized from inside the building/structure.

Any fixed or non-operable windows on the floor below or above and within twenty-five (25) feet of the immediate work area need not to be plasticized, but shall be sealed using caulking or duct tape.

Facades:

Removals without tents will require plasticizing or sealing of nearby windows within twenty-five (25) feet of the immediate work area,

placement of dropcloths, plasticizing of a man-lift or scaffolding and other operational safeguards as outlined below.

For larger work area removals, any operable windows or openings to the building at the work level or on the floor below within twenty- five (25) feet of the immediate work area shall be plasticized with two (2) layers of six (6) mil fire retardant polyethylene sheeting. The windows can be plasticized outdoors, or for reasons of safety, from the indoors. Window, door and louver units subject to complete removal must have their openings plasticized at the interior of the building. Windows that are fixed or non-operable and that will remain sealed airtight for the duration of abatement activities, do not require installation of critical barriers.

Under areas where non-friable materials are removed without tents, a dropcloth, made of six (6) mil fire retardant polyethylene sheeting, shall be placed on the ground below the work area to prevent spread of any ACM remnants. This dropcloth shall be a minimum of ten (10) feet wide with an additional ten (10) feet of width for every floor above a 1st floor level where removal work will take place, up to a maximum of thirty (30) feet of width measured perpendicular to the building/structure. In addition, if a straight scaffolding, man-lift, swing scaffolding or similar equipment is used for areas above the 1st floor, the lift/scaffolding unit shall be plasticized with two (2) layers of six (6) mil fire retardant polyethylene on the platform, with plastic sheeting extended vertically to waist-high (as so equipped) guardrail sides and back of the lift unit. While the platform/lift walking surfaces must be plasticized, the asbestos abatement contractor must provide proper traction surfaces or equipment to assure the safety and comfort of abatement workers while performing abatement activities on the lift/scaffold equipment. After non-friable ACM is removed from each work location, the platform and plasticized surfaces toward the building shall be wet wiped and/or HEPA vacuumed clean before reuse. The plasticizing on the lift or scaffolding shall be periodically inspected during use and repaired as needed.

3.04 PRE-REMOVAL INSPECTIONS:

A. Prior to removal of any ACM the Contractor shall notify the Dobbs Ferry Union Free School District Environmental Consultant and request a pre-removal inspection. Posting of warning signs, plasticizing of work area, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of Dobbs Ferry Union Free School District Environmental Consultant. The Contractor shall not begin asbestos removal until the Dobbs Ferry Union Free School District Environmental Consultant approves the work area preparations.

3.05 <u>MAINTENANCE OF CONTAINED WORK AREA AND DECONTAMINATION</u> ENCLOSURE SYSTEMS:

- A. Repair damaged barriers and remedy any defects immediately upon their discovery. Visually inspect barriers at the beginning and end of each work period.
- B. Visually inspect non-Work Areas and the decontamination enclosure system for water leakage. Check the floor below, ceiling and walls, and view beneath/or around the decontamination enclosure system, for signs of leakage. Perform the visual inspection a minimum of twice each 8- hour work shift.
- C. Ensure that both hot and cold water exist in sufficient supply for the decontamination enclosure system.
- **3.06 REMOVAL OF ASBESTOS-CONTAINING MATERIAL:** The Asbestos Contractor shall be responsible for the proper removal of ACM from the Work Area using standard abatement industry removal techniques. The Environmental Consultant or their representative shall observe the Work. Approval of the Asbestos Contractor's abatement techniques is required by the Environmental Consultant to allow for the continuance of work.

A. Non-friable Flooring and/or Mastic Removal:

Removal of ACM shall utilize manual wet methods for all non-friable ACM removals, as applicable. In no event shall methods be used that may render the ACM friable.

- 1. The asbestos material shall be adequately wetted with amended water. All non-hygroscopic (material that resists wetting) asbestos material shall be thoroughly wetted, prior to and during abatement.
- 2. During Phase II B, all waste generated shall be bagged, wrapped or containerized immediately upon removal. Cleanup of accumulations of loose debris/waste material shall be performed whenever enough loose debris/waste material has been removed to fill a single leak-tight container appropriate for the type of ACM being removed. Cleanup of all remaining waste generated shall be performed at least once prior to close of each work shift. All waste material shall be kept adequately wet at all times.
- 3. Additional amended water shall be added as necessary to the waste bags/containers to ensure that all waste remains adequately wet within the bag/container.
- B. Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS Removal:

Removal of ACM shall utilize manual wet methods for all non-friable ACM removals, and rotating blade roof cutters for roofing removals, as applicable. In no event shall methods be used that may render the ACM friable.

- 1. Residual non-friable ACM shall be wet scraped and HEPA vacuumed. Materials removed shall be containerized or immediately wrapped in two (2) layers of six (6) mil fire retardant plastic sheeting and secured air tight prior to transport to the waste decontamination facility.
- 2. Under façade areas where non-friable ACM is to be removed without tents, whenever possible, an asbestos handler (worker) with a HEPA vacuum will position the vacuum hose within four (4) inches of the material being removed to capture small pieces of non-friable ACM and asbestos fines. The hose end will be positioned so that as many smaller pieces of material as possible will fall into the vacuum hose end. Larger pieces of ACM should be immediately bagged or containerized.
- 3. Asbestos containing materials will not be allowed to accumulate in the work area or on the drop cloth.
- 4. In lieu of using an exterior chute as per Section 8.4(g) of NYS DOL 12 NYCRR Part 56, waste bags and containers may be lowered to the waste trailer/dumpster by crane or hoist using a temporary waste transfer container of adequate size and strength.

3.07 ACM WASTE PACKAGING AND LOAD OUT PROCEDURES:

- A. Packaging of ACM shall conform to OSHA Standard 29 CFR 1926.1101, DOT 49 CFR 171,172, and 173, EPA Standard 40 CFR Part 61, New York City Department of Sanitation (in relation to transport, storage, and disposal of ACM) and the requirement as heretofore specified. ACM waste shall be placed in a wet condition into properly labeled disposal bags or sealed in two layers of 6-mil plastic sheeting wrapped airtight and properly labeled. Materials to be transported through a non-Work Area building space shall be placed in hard wall shipping containers for handling. Specific requirements for decontamination of waste containers, and load out through the decontamination enclosure systems is outlined below:
- B. Frequency of Waste Removal: Properly packaged and labeled asbestos waste shall be removed from the site on a daily basis. Under no circumstance shall asbestos waste be stored on site. The waste hauler and landfill shall be as indicated on the notifications to regulatory agencies.
- C. Waste Load-out Through Waste Decontamination Unit: Place asbestos waste in disposal bags. Large items not able to fit into disposal bags shall be wrapped in one layer of 6-mil thick plastic sheeting. Clean outer covering of asbestos waste

package by wet cleaning and/or HEPA vacuuming in a designated part of the Work Area. Move wrapped asbestos waste to the washroom, wet clean each bag or object and place it inside a second disposal bag, or a second layer of 6-mil plastic sheeting, as the item's physical characteristics demand. Air volume shall be minimized, and the bags or sheeting shall be sealed airtight with tape.

- D. The clean containerized items shall be moved directly to the Waste Hauler's truck pending load-out to storage or disposal facilities.
- E. Workers who have entered the decontamination enclosure system from the uncontaminated non-work area shall perform load-out of containers from the decontamination enclosure holding area. Dress workers asbestos waste to storage or disposal facilities in clean overalls of a color different than from that of coveralls used in the Work Area. Ensure that workers do not enter from uncontaminated areas into the equipment washroom or the Work Area. Ensure that contaminated workers do not exit the Work Area through the equipment decontamination enclosure system.
- F. Thoroughly clean the decontamination enclosure system immediately upon completion of the waste load-out activities, and at the completion of each work shift.
- G. Labeled ACM waste containers or bags shall not be used for non-ACM debris or trash. Any materials placed in labeled containers or bags, whether turned inside out or not, shall be handled and disposed of as ACM waste.
- **3.08** <u>CLEANUP AND CLEARANCE TESTING OF WORK AREAS</u>: The following clean-up procedures shall be performed during abatement.

A. Non-friable Flooring and/or Mastic Removal methods:

Clearance Procedure Utilizing Non-friable Flooring and/or Mastic Removal methods - Cleaning of the work areas and other contaminated areas shall be conducted in accordance with procedure described below:

- Step 1. Clean-up Visual Inspection
- Step 2. Final Re-occupancy Visual Inspection and fiber clearance count of <0.01 fiber/cc of air using PCM NIOSH method 7400 analysis procedures or <70 s/mm² using TEM AHERA 40 CFR Part 763 Appx. A subpart E methods.
- 1. If required during Phase IIB, the negative pressure ventilation units shall remain in continuous operation during implementation of Phase IIC, including observance of settling/waiting periods and drying times.

- 2. All objects and surfaces in the regulated abatement work area shall be HEPA-vacuumed and then wet-cleaned. After the final cleaning is complete, clearance air sampling shall not commence until the appropriate waiting/settling or drying time requirements have elapsed and a visual inspection has been completed by the project monitor to confirm that the scope of abatement work for the asbestos project is complete, and no visible asbestos debris/residue, pools of liquid, or condensation remain. The asbestos abatement contractor supervisor must complete a satisfactory visual inspection for completeness of abatement and cleaning, prior to commencement of the project monitor visual inspection.
- 3. Clearance air samples will be collected after abatement according to established air clearance criteria per New York State ICR 56 and AHERA 40 CFR Part 763 Appx. A subpart E. The analysis method used and quantity of air samples collected will be based on the type and quantity of material being abated. All PCM and TEM results must satisfy the clearance criteria for re-occupancy.
- 4. When volumes greater than or equal to 1,199 liters for a 25 mm filter have been collected and the average number of asbestos structures on TEM samples inside the abatement area is no greater than 70 s/mm² of filter, the abatement work shall be considered complete without comparing the inside samples to the outside samples.
- B. Exterior Project Removal of Non-friable ACM Roofing, Siding, Caulking, Glazing Compound, Transite, Tars, Sealers, Coatings, and Other NOB ACMS removal methods:
 - 1. Clean-Up Procedures During Abatement. The following clean-up procedures shall be performed during abatement.
 - a. Visible accumulations of loose asbestos containing waste material shall be cleaned up using rubber or plastic dustpans and rubber squeegees or HEPA filtered vacuums. Metal shovels may also be used, except in the vicinity of plastic sheeting, critical barriers and isolation barriers, which could be perforated by these tools. To pick up excess water and gross wet debris, a wet-dry HEPA filtered shop vacuum dedicated to asbestos abatement may be used. This cleaning shall be done whenever there is sufficient asbestos waste material to fill a single leak-tight bag/container, or this cleaning shall be done at the end of each work shift whichever shall occur first. Visible debris shall be maintained adequately wet.

- b. Work shall stop whenever excessive water accumulation or flooding is present in the area and shall not resume until the water is collected and disposed of properly.
- 2. **Final Cleaning and Clearance Procedures.** Final clean-up and clearance procedures for abatement shall comply with Section 56-9 of NYS DOL 12 NYCRR Part 56, except that only one (1) stage of cleaning (final) is to be performed. Lockdown encapsulant use is not required.
 - **Exemption from Project Monitor Visual Inspection.** Asbestos a. projects which are exempt from clearance air sampling requirements twofamily owner occupied residential buildings/structures, are also allowed an exemption from the project monitor visual inspection requirements. For asbestos projects utilizing this exemption, once final cleaning is complete, a visual inspection shall be completed by the asbestos abatement contractor's supervisor to confirm that the scope of abatement work for the asbestos project is complete, and no visible debris/residue, pools of liquid, or condensation remain. The results of this inspection shall be documented by the asbestos abatement contractor's supervisor in the asbestos abatement contractor daily project log, and once the asbestos project is complete the asbestos abatement contractor's supervisor shall also obtain the owner's written acceptance of the final results of the asbestos project within the daily project log.

3.09 <u>DISPOSAL AND TRANSPORTATION OF ASBESTOS-CONTAMINATED</u> <u>WASTE</u>:

- A. Storage of Containerized ACM: As the work progresses, remove sealed and labeled bags of ACM from the Work Area and place in a lockable trailer, dumpster, or other container approved for storage or transport of asbestos waste. The waste container shall be lined with two layers of 6-mil fire retardant plastic on all sides. Asbestos-containing waste shall remain under the positive control of the Asbestos Contractor and must never be left unattended in an area or on a vehicle where unauthorized persons could gain access. Containerized ACM shall be removed from the site on a daily basis. Unless specifically approved in writing by the Owner, ACM shall not be permitted to be stored on site during non-working hours.
- B. Sealed and labeled bags or waste wrapped in two layers of plastic sheeting sealed airtight shall be used to transport asbestos-contaminated waste to the landfill. Procedures for hauling and disposal shall comply with 40 CFR, Part 61, 49 CFR, Part 171 and 172, and other applicable state, regional, and local government regulations. Procedures for removal from the Work Area and disposal of waste are outlined below:
- C. A properly completed and original "Waste Shipment Record" form shall

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accompany asbestos waste, which is transported to a disposal site. This form shall be signed and dated by each party who has control over the asbestos waste, and a copy retained by each party as responsibility for the waste is transferred to the next party. All original manifest forms and waste receipts shall be provided to the Architect. The Environmental Consultant shall be provided with copies of all waste manifests.

- D. Trucks hauling asbestos waste shall be totally enclosed to prevent loss or damage to waste container en-route to approved landfill. The interior of the vehicles shall be lined with two layers of 6-mil plastic.
- E. Mark with a visible warning sign during the loading and unloading of asbestos-containing waste all vehicles used to transport the waste material. Danger sign legend, text size, style and arrangement shall conform to the requirements of EPA Standard 40 CFR Part 61.149 (d) (I).
- F. Only sealed plastic bags or completely sealed items shall be deposited in landfill. Damaged, broken sealed windows or leaking plastic bags shall be resealed prior to being deposited in the landfill. Workers shall place asbestos waste in the landfill. Throwing or dumping of containers shall not be allowed. Workers unloading and handling the sealed bags/drums at the disposal site shall wear appropriate personnel protective equipment including respirators and protective clothing.
- G. After the vehicle is unloaded at the landfill, the plastic sheeting that was taped to the floor, sides and top of the truck shall be carefully removed and placed in properly labeled bags for disposal with the rest of the waste.

END OF SECTION

LIST OF SUBMITTALS

<u>SUBMITT</u>	AL APPROVED	DATE SUBMITTED	DATE
Pre-I	Project Submittal:		
1.	Insurance		
2.	All required bonds		
3.	List of Subcontractors		
4.	Health and Safety Plan		
5.	Proof that all required permits and variances have been obtained		
6.	Documentation of Required Qualifications of Workers		
7.	Proof of a respiratory protection program.		
8.	Proof of historic airborne fiber data.		
9.	Proof that a landfill site has been located.		
10.	MSDS of chemicals to be used on this project.		
11.	Asbestos Removal and Disposal Work Plan		
Durin	ng Work Submittal:		
1.	Schedule of Work Changes		
2.	Notarized copy of weekly payroll showing a prevailing wage rate has been paid.		
3.	A "Request For Services" form.		
4.	Results of all air monitoring performed by the Contractor (OSHA)		

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5.	A certified, signed, and completed copy of each " Waste Shipment Record" form (Section 1.07)					
6.	A copy of the bound log book					
Post Project Submittal:						
1.	A notarized "Release of Liens"		-			
2.	Proof of payment of prevailing wage rate		-			
3.	Notarized copies of a daily log.		-			
4.	Compilation in chronological order of all air monitoring records pertaining to this project.		-			
5.	Compilation of all completed and signed Waste Shipment Record forms.					
6.	Copies of notifications to applicable agencies.		-			
7.	Paid invoice verifications for sub-contractor (for Time and Material job), service contract agreement, insurance certificates, copies of the workers licenses, and other required submittals.					

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4 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.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress.

- 3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
- 4. Review areas where existing construction is to remain and requires protection.

1.6 SUBMITTALS, GENERAL

A. General: Submit all informational submittals required by this Section concurrently.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.

C. Predemolition Inventory:

- 1. Submit list of items to be removed and salvaged as part of selective demolition work.
- 2. Submit list of items to be removed and reinstalled as part of selective demolition work.
- D. Predemolition Photographs or Video: Show existing conditions, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit photos or video recordings on thumb drive before Work begins. Include copy of key plan indicating each photograph's or video's location and direction.
 - 1. Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modification.
 - 2. Photographs: Provide high-resolution color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels.
 - a. Name each image with date photograph was taken, location, and unique sequential number keyed to accompanying key plan in file name.
 - 3. Video: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels.
 - a. Name each video recording with date video recording was recorded, location, and unique sequential number keyed to accompanying key plan in file name.
 - b. Begin narration of each video recording with Contractor's name, videographer's name, and location in Project.
 - 1) Describe scenes on video recording by audio narration.
 - 2) Confirm date and time at beginning and end of recording.

1.8 CLOSEOUT SUBMITTALS

A. Inventory:

- 1. Submit a list of items that have been removed and salvaged.
- 2. Submit a list of items that have been removed and reinstalled.
- B. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- C. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.9 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.10 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 of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.11 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and restore 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. Notify warrantor before proceeding. Existing warranties include the following:
 - 1. Roofing.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.12 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- B. 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.
- C. 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.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Record existing conditions by use of preconstruction photographs or video.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by demolition operations.
 - 2. Inventory and record the condition of items to be removed and reinstalled. Provide photographs or video of conditions that might be misconstrued as damage caused by demolition operations.
- F. Beginning selective demolition constitutes Contractor's acceptance of conditions.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

- e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."
- 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.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 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.

- 2. 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.
- 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 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. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

- 1. Clean and restore items to functional condition adequate for intended reuse.
- 2. Pack or crate items after cleaning and restoring. 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.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for Removal of Resilient Floor Coverings."
- E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Division 07 Sections for new roofing requirements.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- 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. 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.

3.8 CLEANING

A. 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 02 41 19

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, accessories, placement procedures, and finishes, for the following:
 - 1. Footings.
 - 2. Foundation walls.
 - 3. Slabs-on-grade.
 - 4. Suspended slabs.
 - 5. Concrete reconstruction and corrective work.

1.3 DEFINITIONS

A. 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.

1.4 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data: For each type of product indicated.
 - a. Fiber reinforcement.
 - b. Vapor barrier.
 - c. Curing compound.
 - d. Slab control joint sealer.
 - e. Penetrating silane sealer.
 - f. Grout.
 - g. Chemical anchor adhesives.
 - h. Corrective mortar (industry name is Repair mortar).
 - i. Thin coat patching mortar.
 - j. Corrective overlayment (industry name is Repair overlayment).
 - 2. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Pumping of concrete requires a mix design specifically prepared and previously used for pumping.

- a. Indicate amounts of mixing water to be withheld for later addition at Project site.
- b. Include compressive strength test reports.
- c. Include all ingredient certifications and product data concurrently.
- 3. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Show all concrete wall and footing reinforcement on elevation drawings at a scale not less than 1/4-inch = 1 ft. Do not submit placement plans showing only piece marks referencing a cut list.
- 4. Slab-on-Grade Control Joint Layout Drawings: Indicate joints as shown on Drawings and proposed locations following required spacing requirements.

B. Informational Submittals:

- 1. Material Certificates: For each type of the following, signed by manufacturers or suppliers:
 - a. Reinforcing bars.
 - b. Epoxy-coated reinforcing bars.
 - c. Welded wire fabric.
 - d. Joint dowel bars.
 - e. Epoxy-coated joint dowel bars.
 - f. Cementitious materials.
- 2. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
 - a. Aggregates.
 - b. Vapor Barrier.
- 3. Proposed curing method for all concrete elements.
- 4. Curing compound compatibility with floor finishes and adhesives certificate.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

- C. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 to perform material evaluation tests and to design concrete mixtures.
 - 1. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- F. Mockups: Cast concrete slab-on-grade and formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, Flooring Treatments, and standard of workmanship.
 - 1. Build panel approximately 200 sq. ft. for slab-on-grade and 100 sq. ft. for formed surface in the location indicated or, if not indicated, as directed by Architect.
- G. Structural Preconstruction Conference: Attend conference at Project site.
- H. Slab Pre-Pour Conference: Attend conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips 3/4 by 3/4 inch, minimum.

- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. VOC compliant.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Epoxy-Coated Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed bars, ASTM A 775/A 775M or ASTM A 934/A 934M, epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.
- C. Plain-Steel Welded Wire Fabric: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, ASTM A 775/A 775M epoxy coated.
- C. Epoxy Corrective Coating: Liquid, two-part, epoxy corrective coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.
- D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For exterior concrete, use galvanized wire or dielectric-polymer-coated wire bar supports.
 - 2. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 - 3. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I. Supplement with the following (optional):
 - a. Fly Ash: ASTM C 618, Class F or C.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
 - 2. Blended Hydraulic Cement: ASTM C 595 Type IS, portland blast-furnace slag; Type IP, portland-pozzolan; Type I (PM), pozzolan-modified portland; or Type I (SM), slag-modified portland cement.
- B. Normal-Weight Aggregates:
 - 1. Provide aggregates from a single source.
 - 2. ASTM C 33, Class 3S coarse aggregate or better, graded.
 - 3. ASTM C 33, Class 4S coarse aggregate or better, graded, for exterior concrete.
 - 4. Maximum Coarse-Aggregate Size:
 - a. Slabs on Grade: 1-1/2 inches nominal.
 - b. All Other Concrete: 1 inch nominal.
 - 5. Fine Aggregate: ASTM C 33. Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 1602/C 1602M and potable.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing chlorides.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Accelerating Admixture: ASTM C 494/C 494M, Type C.
 - 4. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 5. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
 - 6. Mid-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type A or Type F. Water content reduction to be greater than 7%.
 - 7. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

- 8. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
- 9. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 FIBER REINFORCEMENT

- A. Synthetic Macro-Fiber: Polyolefin macro-fibers (containing no reprocessed olefin materials) engineered and designed for use as secondary reinforcing in concrete, complying with ASTM C 1116/C 1116M, Type III, 1 1/4 to 2-1/4 inches long, varying fiber thickness, and no water absorption.
 - 1. Products: Subject to compliance w ith requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. 3M; Scotchcast Polyolefin Fibers 2".
 - b. BASF Construction Chemicals, "MasterFiber MAC" Series
 - c. Euclid Chemical Company (The), an RPM company; Tuf-Strand SF.
 - d. FORTA Corporation; FORTA FERRO.
 - e. Grace Construction Products, W. R. Grace & Co.; Strux 90/40.
 - f. Nycon, Inc.; XL.
 - g. Propex Concrete Systems Corp.; Fibermesh 650.
 - h. Sika Corporation; Sika Fiber MS10.

2.7 VAPOR BARRIER

- A. Vapor Barrier: Water-vapor transmission rate (permeance) less than 0.015 perms (gr/ft²/hr/in-Hg), in accordance with ASTM E 1745. The product must meet water-vapor transmission rate (0.01 perms) requirement for both the new material and the ASTM E 1745 mandatory conditioning tests (ASTM E 1745; paragraphs 7.12 through 7.15.) Provide all manufacturers' accessories required for complete installation including mastic and seam tape. Seam tape to be provided with a water-vapor transmission rate of 0.3 perms or lower.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Layfield Construction Materials; VaporFlex 15.
 - b. Reef Industries, Inc.; Griffolyn Vaporguard.
 - c. Stego Industries, LLC; Stego Wrap 15 mil Class A.

2.8 CURING MATERIALS

- A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet
- B. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1-D, Class B, dissipating, with fugitive dye.
- C. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ½-inch rigid, extruded polystyrene insulation (at exterior walls,) ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.
- B. Slab Control Joint Sealer: Two-component, self-leveling, flexible, 100 percent solids, epoxy resin and adhesive with a Type A shore durometer hardness of 80 per ASTM D 2240 and conforming to ACI 302.1R (5.12-Joint Materials).
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Chem Masters; PolyTops 480.
 - b. Euclid Chemical Company (The); Euco 800.
 - c. Sika Corporation; Sikadur 51 SL.
- C. Penetrating, Silane Sealer: Single component, minimum 40% silane, waterbased slab sealer that forms chemical bond to the concrete. VOC compliant.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Construction Chemicals; Enviroseal 40.
 - b. Chem Masters; Aquanil Plus 40.
 - c. Dayton Superior Corporation; Weather Worker 40% J29WB.
- D. Bond breakers: Waterborne, VOC compliant form release agent.
- E. Bonding Agent: ASTM C 882/C 882M, liquid bonding agent specifically designed to bond fresh cementitious materials to a variety of substrates for interior and exterior applications and provide an anti-corrosion coating for reinforcing steel.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Construction Chemicals; Emaco P24.
 - b. Euclid Chemical Company (The); Corr-Bond.
 - c. Sika Corporation; Sika Armatec 110 EpoCem.
- F. Grout: ASTM C 1107, factory-packaged, shrinkage-resistant, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
- G. Chemical Anchor Adhesives: Heavy duty, two component injectable adhesive designed to be dispensed using double chamber gun with mixing nozzle. Adhesives in capsule form will not be accepted.

- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hilti, Inc.; Hit-HY 200; Hit-Ice
 - b. ITW Redhead; Epcon C6.
 - c. Powers Fasteners, Inc.; AC100+ Gold.

2.10 RECONSTRUCTION AND CORRECTIVE MATERIALS

- A. Corrective Mortar (Industry name is Repair Mortar): Site-mixed Portland-cement mix for vertical and overhead surfaces. Mix dry-pack corrective mortar, consisting of one part shrinkage-compensating, Portland cement to two and one-half parts fine aggregate passing a No. 16 sieve by damp, loose volume, using only enough water for handling and placing.
- B. Thin Coat Patching Mortar: Polymer modified, Portland cement, suitable for interior and exterior applications. Featheredge up to 3/16 inch. For thicker applications manufacturer's recommendations to extend mix with an aggregate may apply.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Construction Chemicals; Chemrex Levelprep.
 - b. ChemMasters, Inc.; ChemFlow HS.
 - c. Euclid Chemical Company (The); Duraltop Flowable Mortar.
- C. Corrective Overlayment (Industry name is Repair Overlayment): Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations. For thicker applications manufacturer's recommendations to extend mix with an aggregate may apply.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.11 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, according to ACI 301.
 - 1. Use a qualified independent 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:
 - 1. Fly Ash: 25 percent, but if used, a minimum of 15 percent.
 - 2. Combined Fly Ash and Pozzolan: 25 percent.
 - 3. Ground Granulated Blast-Furnace Slag: 50 percent.
 - 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing, high-range water-reducing or plasticizing admixture in all concrete. Design mix for optimum placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use a mid-range, water-reducing admixture in pumped concrete, all concrete slabs (including concrete walks), concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings, Piers, Foundation Walls, Grade Beams, Building Walls, or Frame Members: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch; or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.
- B. Interior Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 3500 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 - 3. Minimum Cementitious Materials Content: 470 lb/cu. yd..
 - 4. Slump Limit: 4 inches, plus or minus 1 inch.
 - 5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
 - 6. Synthetic Macro-Fiber: Uniformly disperse in concrete mixture, at concrete batch facility, at manufacturer's recommended rate, but not less than 3.0 lb/cu. yd..

2.13 CONCRETE MIXTURES FOR EXTERIOR CONCRETE

- A. Exterior Architectural Concrete Elements And Retaining Walls: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4500 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch; or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.
- B. Exterior Slabs (concrete pads, walks and curbs): Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4500 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch; or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 - 4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 - 5. Synthetic Macro-Fiber: Uniformly disperse in concrete mixture, at concrete batch facility, at manufacturer's recommended rate, but not less than 3.0 lb/cu. yd..
- C. Exterior Suspended Slabs: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4500 psi at 28 days.
 - 2. Minimum Cementitious Materials Content: 520 lb/cu. yd..
 - 3. Maximum Water-Cementitious Materials Ratio: 0.50.
 - 4. Slump Limit: 4 inches, plus or minus 1 inch; or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 - 5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 - 6. Synthetic Macro-Fiber: Uniformly disperse in concrete mixture, at concrete batch facility, not less than 4.0 lb/cu. yd..

2.14 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.15 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade conditions are satisfactory prior to forming or pouring concrete. Owner's Testing Agency shall inspect slab and footing subgrade prior to placing concrete.
- B. Verify that reinforcing, including masonry dowels, is properly in place prior to pouring concrete.
- C. Verify that formwork is complete and properly secured prior to placing concrete.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 - 2. Class C, 1/2 inch for rough-formed finished surfaces without additional finish, permanently exposed.
 - 3. Class D, 1 inch for concealed, rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.

- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.
- M. For smooth-rubbed finish, provide uniform spacing and size of cone ties which break off at least 1-1/2 inches from face of concrete and leave holes not more than 1-inch diameter in face of concrete.

3.3 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. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 - 2. Install leveling plates, bearing plates, railing sleeves, brackets, and all other embedded steel items shown on Drawings.
 - 3. Install reinforcing steel required for attachment of masonry to concrete structures.
 - 4. Install sleeves for pipe, conduit and other items passing through cast-in-place structural concrete. Coordinate with other trades for sleeve details, invert elevations, locations, and sizes.

3.4 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and provide corrective work to surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.5 VAPOR BARRIERS

- A. Place, protect, and correct vapor barrier according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.6 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor barrier or retarder. Correct damage and reseal vapor barrier or retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Correct cut and damaged epoxy coatings with epoxy corrective coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- G. Field bending or straightening of bars partially embedded in concrete is permitted only where shown on the Drawings.
- H. All openings in concrete walls with a dimension of one foot or greater are to have two #5 bars on all sides of opening, unless noted otherwise.

3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Roughen surface of hardened concrete, wet surface, and immediately pour fresh concrete against wet surface.
- C. Vertical Control Joints in Walls: Space vertical control joints in walls that have any portion exposed to public view as shown on Drawings or, if not indicated, at 20 feet maximum.
- D. Control joints in Slabs-on-Grade: 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. 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 will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Space joints as shown on Drawings or, if not indicated, at 12 feet average spacing and not exceeding 15 feet. Locate joints at column centerlines where possible.
- E. Isolation Joints in Slabs-on-Grade: Install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- F. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. For concrete topping placed over precast plank:
 - 1. Precast hollow core slab surface must be thoroughly cleaned prior to application of topping. Precautions must be taken to clean the precast hollow core slab surface of all laitance.
 - 2. The surface of the precast hollow core slab is to be dampened, with no standing water.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, (4.3.2.1 Slump Adjustment.)
 - 1. With each concrete mixture submittal, indicate amounts of mixing water to be withheld for later addition at Project site.
 - 2. Water added must not increase the water-cement ratio past the approved mix design ratio.
 - 3. Add additional water reducer or plasticizer to mix instead of adding water to achieve flowable, workable concrete. Do not add water to concrete after adding these admixtures to mixture.
 - 4. Do not add water after truck is more than half empty.

- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. 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.
 - 4. Concrete placed over steel deck is to have a minimum thickness as shown on the Drawings. Thickness of the slab will be greater at the center of the beam or deck spans as they deflect during casting of the concrete. Estimated deflections of the composite beams due to the wet weight of the concrete are indicated on the plans. Compensate for beam deflection by adding additional concrete as required near the center of the beam span.
 - 5. Concrete topping placed over precast plank is to have a minimum thickness as shown on the plans. This thickness is to be measured at the center of the precast plank span. Topping is to be placed in accordance with the levelness and flatness requirements noted, therefore the topping may be greater at the ends of the precast plank due to the camber of the precast plank. Compensate for camber by adding additional concrete as required near the ends of the precast plank span.
- E. 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. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

- 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
- 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
- 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and ACI 305R and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects corrected and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Correct and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view, or to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

- 1. Apply float finish to surfaces to receive broom finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces exposed to view.
 - a. **For fiber reinforced concrete**, to provide consolidation and bury surface fibers, open slab surfaces to be struck off with a vibrating screed or laser screed. Where a laser screed is used, adjust the magnitude of vibration and control the speed of the refracting leveling head to ensure adequate consolidation of the concrete and embedment of the fibers. Magnesium floats in the form of a bullfloat, channel radius float, or highway straightedge to be used to establish a surface and close tears or open areas. **Do not use wood floats**.
 - 2. Flatness and Levelness: Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
 - a. Conventional: Specified overall values of flatness, F(F) 20; and of levelness, F(L) 15; with minimum local values of flatness, F(F) 15; and of levelness, F(L) 10; for thickset tile finishes and all other floor finishes not noted below.
 - b. Moderately Flat: Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15; for slabs to receive carpeting, vinyl composition tile, and linoleum.
 - c. Flat for Slabs on Grade: Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs to receive thinset ceramic tile.
 - 3. 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 1/4 inch.
 - 4. For all floor finish classifications, also measure floor finish tolerances after slab has cured and dried out, within 2 weeks before installation of floor finish materials to establish compliance with flooring manufacturer's tolerance requirements and to determine if corrective leveling is required.
- D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces to receive carpet, vinyl composition tile. While concrete is still plastic, slightly scarify surface with a fine broom.
 - 1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- E. Broom Finish: Apply a broom finish to exterior concrete walks, slabs, platforms, steps, ramps, and elsewhere as indicated.

- 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application. **For synthetic fiber reinforced concrete**, pull broom in a single direction and do not excessively overlap previously textured concrete.
- F. Exposed Architectural Concrete Surfaces: Use the same finish procedure for all pours. All pours to be done in similar weather conditions. Use breathable sealer after set to prevent efflorescence.
- G. Exterior Concrete Walks and Slabs: Apply penetrating, silane sealer per manufacturer's instructions.

3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with inplace construction. 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; and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated 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. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 and 305R for hot-weather protection during curing.

- B. Slabs: Protect slabs within building from precipitation accumulation. Immediately remove water, snow or ice from surface of slabs within building regardless if source is from precipitation, construction activities, etc.
- C. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- D. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- E. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- F. Cure concrete according to ACI 308.1, by one of the following methods:
 - 1. 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. Cure for not less than seven days. Immediately correct any holes or tears during curing period using cover material and waterproof tape.
 - a. Use moisture-retaining covers to cure all interior slabs on grade.
 - 2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and correct damage during curing period.
 - a. Ensure compatibility of curing compounds with finish flooring and adhesives, prior to use, otherwise provide curing method such as continuous sprinkling, or remove curing compound through blast-tracking or similar method prior to installation of flooring.
- G. Exposed Architectural Concrete Surfaces: From time of pour, to Final Completion, protect all Architectural Concrete elements from damage, disfiguration, discoloration, staining, and all other types of damage which would affect the final appearance of the Architectural Concrete elements. Protection is to include, but is not limited to:
 - 1. All hydraulic powered equipment must be diapered to avoid staining on the concrete.
 - 2. Drops cloths need to be placed under vehicles/equipment at all times.
 - 3. No pipe cutting machines shall be used on the slabs.
 - 4. Steel shall not be placed on slabs to avoid rust staining.
 - 5. Provide shields and other protective elements over Architectural Concrete elements.

3.13 JOINT SEALING

- A. Prepare, clean, and install slab control joint sealer according to manufacturer's written instructions.
 - 1. Defer joint sealing until concrete has aged at least one month. Do not seal joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint sealer full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint sealer flush with top of joint after hardening.

3.14 CONCRETE SURFACE CORRECTIVE WORK

- A. Defective Concrete: Correct and patch defective areas when approved by Architect. Remove and replace concrete that cannot be corrected and patched to Architect's approval.
- B. Correcting Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins, exposed or otherwise visible fiber reinforcement, and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Remove exposed or otherwise visible fiber reinforcement from the concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with corrective mortar before bonding agent has dried. Fill form-tie voids with corrective mortar or cone plugs secured in place with bonding agent.
 - 2. Correct defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, corrective mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Correct defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- C. Correcting Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Correct finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions such as exposed or otherwise visible fiber reinforcement.

- 2. After concrete has cured at least 14 days, correct high areas by grinding.
- 3. Remove exposed or otherwise visible fiber reinforcement from the concrete surface. If concrete surface is damaged by the process of fiber removal, correct surface as described by the remainder of this section.
- 4. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with thin coat patching mortar. Finish corrected areas to blend into adjacent concrete.
- 5. Correct other low areas scheduled to remain exposed with a corrective overlayment. Cut out low areas to ensure a minimum corrective overlayment depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply corrective overlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
- 6. Correct defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- 7. Correct random cracks and single holes 1 inch or less in diameter with corrective overlayment. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete. Place corrective overlayment before surface has dried. Finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- D. Perform structural reconstruction of existing concrete according to the Drawings.

3.15 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports, except where noted.
- B. Contractor to supply all batch tickets to Owner's testing agency. Batch tickets to note w/c ratio and amount of water allowed to be added at Project site.
- C. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Steel reinforcement welding.

- 3. Chemical Anchors: Test 5% of all chemical anchors in tension, randomly selected but in varied locations. Testing to be in accordance with ASTM E 488 to the approved manufacturer's allowable loads. Concrete must cure a minimum of 3 days prior to testing. Do not test anchors until after the anchor manufacturer's recommended curing time. If an anchor fails during this test additional anchors may be requested to be tested as directed by the Architect.
- 4. Headed bolts and studs.
- 5. Verification of use of required design mixture.
- 6. Concrete placement, including conveying and depositing.
- 7. Curing procedures and maintenance of curing temperature.
- 8. Verification of concrete strength before removal of shores and forms from beams and slabs.
- 9. Vapor barrier inspection after installation. To be performed by the vapor barrier manufacturer. Verify correct installation according to specifications and details. To be performed no more than 48 hours prior to slab pour.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day, nor less than once per each 5000 square foot of surface area of walls or slabs.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Include corresponding concrete mix batch tickets with each test report.
 - 3. Indicate amount of water added to batch at Project site.
 - 4. Slump: ASTM C 143/C 143M; 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. Perform additional tests when concrete consistency appears to change. Measure after slump adjustment. Pumped concrete is to be tested at point of placement, with an additional slump test taken at point of delivery.
 - 5. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 6. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.

- 7. Density (Unit Weight): ASTM C 138/C 138M, fresh unit weight of concrete. Two tests per truck load; one at beginning of pour and near end of pour.
- 8. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and standard cure six (6) cylinder specimens for each composite sample.
 - b. Cast and field cure two (2) standard cylinder specimens for each composite sample.
 - c. Autoclave curing and oven-drying of test specimens containing synthetic fiber is not permitted.
- 9. Compressive-Strength Tests: ASTM C 39/C 39M;
 - a. Test two standard cured specimens at 7 days, three specimens at 28 days, and retain one specimen for testing at 56 days as deemed necessary by Architect.
 - b. Test two field-cured specimens at 28 days.
 - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 - d. If one specimen in the test shows evidence of improper sampling, molding or testing, discard the specimen and consider the strength of the remaining cylinders to be the test result. If more than one specimen in a test shows any defects, discard the entire test.
- 10. Test for workability and air content of each synthetic fiber reinforced concrete mixture composite sample taken according to ASTM C172 (except that wet-sieving is not permitted) and whenever consistency of concrete appears to vary, according to ASTM C 1116.
- 11. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- 12. 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.
- 13. Test results shall be reported in writing to Architect, 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 inspecting 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 both 7- and 28-day tests.
- 14. Nondestructive Testing: Impact-echo, ultrasonic methods, or other nondestructive methods may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

- 15. Additional Tests: 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. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
- 16. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 17. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 03 30 00

SECTION 03 48 10 - PRECAST CONCRETE LIGHTING POLE BASES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Precast concrete bases for site lighting poles.
- 2. Concrete with commercial architectural finish.

1.3 SUBMITTALS

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

B. Action submittals

- 1. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests. Include all ingredient certifications and product data concurrently.
- 2. Shop Drawings: Include pole base locations, plans, elevations, dimensions, shapes and sections, openings, and reinforcement. Detail fabrication and installation of pole bases.
 - a. Indicate joints, reveals, and extent and location of each surface finish.
 - b. Detail loose and cast-in hardware, lifting and erection inserts, anchor bolts, and grounding rod.
 - c. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
 - d. Include and locate openings, including for conduit.
 - e. Indicate location of each pole base by same identification mark placed on panel.

3. Samples:

a. For each type of finish indicated on exposed surfaces of pole bases with architectural finish, in sets of 3, illustrating full range of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches.

C. Informational submittals

1. Qualification Data: For fabricator.

- 2. Material Certificates: For the following, from manufacturer:
 - a. Reinforcing materials.
 - b. Cementitious materials.
- 3. Material Test Reports: For aggregates.
- 4. Source quality-control reports.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications
 - 1. Participates in PCI's Plant Certification program at time of bidding and is designated a PCI-certified plant as follows:
 - a. Group CA, Category C1A Precast Concrete Products (no prestressed reinforcement).
- B. Design Standards: Comply with ACI 318 and design recommendations in PCI MNL 120, "PCI Design Handbook Precast and Prestressed Concrete," and in PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."
- C. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 116, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products."
- D. Sample Panels: After sample approval and before fabricating precast structural concrete units with architectural finish, produce a minimum of 2 sample panels approximately 12 by 12 by 2 inches for review by Architect. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample panels.
 - 1. Damage part of an exposed-face surface for each finish, color, and texture, and demonstrate adequacy of corrective work techniques proposed for correction of surface blemishes.
 - 2. After approval of corrective work technique, maintain one sample panel at fabricator's plant and one at Project site in an undisturbed condition as a standard for judging the completed Work.
 - 3. Demolish and remove sample panels when directed.
- E. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Support units during shipment on nonstaining shock-absorbing material in same position as during storage.

- B. Store units with adequate bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
 - 1. Store units with dunnage across full width of each bearing point unless otherwise indicated.
 - 2. Place adequate dunnage of even thickness between each unit.
 - 3. Place stored units so identification marks are clearly visible, and units can be observed.
- C. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses that would cause cracking or damage.
- D. Lift and support units only at designated points shown on Shop Drawings.

1.6 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction before starting that 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.
 - 1. 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.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. 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 116.

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 116, 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.
- C. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 116.
- D. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
 - 1. Water-Reducing Admixtures: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
 - 5. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 6. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 7. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M.

2.4 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 pole base fabricator's option.
- C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 116 when tested according to ASTM C 1218/C 1218M.
- D. Normal-Weight Concrete Mixtures: Proportion full-depth mixture 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.
 - 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 116.
- 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 116.
- G. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

H. Concrete Mix Adjustments: Concrete mix design adjustments may be proposed by fabricator if characteristics of materials, Project conditions, weather, test results, or other circumstances warrant.

2.5 MOLD FABRICATION

- A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement by release agent.
- B. Maintain molds to provide completed pole bases 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 or radiused as detailed on Drawings.

2.6 FABRICATION

- A. Set anchor bolts according to anchor-bolt templates furnished by light pole manufacturer.
- B. Cast-in reglets, slots, holes, and other accessories in pole bases as indicated on the Contract Drawings.
- C. Cast-in openings larger than 10 inches in any dimension. Do not drill or cut openings or reinforcing bars without Architect's approval. Coordinate size and locations of openings required for conduit or other equipment.
- D. Reinforcement: Comply with recommendations in PCI MNL 116 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.
 - 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 reinforcing steel to maintain at least 1 1/2-inch minimum concrete cover. 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.
- E. Reinforce pole bases to resist handling, transportation, and erection stresses.
- F. Comply with requirements in PCI MNL 116 and in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- G. Place concrete in a continuous operation to prevent seams or planes of weakness from forming in precast concrete units.

- H. 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 116.
- I. Comply with ACI 306.1 procedures for cold-weather concrete placement.
- J. Comply with PCI MNL 116 procedures for hot-weather concrete placement.
- K. Identify pickup points of pole bases and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each pole base on a surface that will not show in finished structure.
- L. Cure concrete, according to requirements in PCI MNL 116, 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.
- M. Discard and replace pole base that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless corrective work meets requirements in PCI MNL 116 and meet Architect's approval.

2.7 FABRICATION TOLERANCES

A. Fabricate pole bases straight and true to size and shape with exposed edges and corners precise and true so each finished unit complies with PCI MNL 116 product dimension tolerances.

2.8 COMMERCIAL FINISHES

A. Smooth, steel trowel finish unformed surfaces (i.e.: top of pole base.) Consolidate concrete, bring to proper level with straightedge, float, and trowel to a smooth, uniform finish.

2.9 COMMERCIAL ARCHITECTURAL FINISHES

- A. Manufacture member faces free of joint marks, grain, and other obvious defects with corners, including false joints, uniform, straight, and sharp. Finish exposed-face surfaces of precast concrete units to match Drawings and as follows:
 - 1. Smooth-Surface Finish: Provide surfaces free of excessive air voids, sand streaks, and honeycombs, with uniform color and texture.

2.10 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to evaluate pole base fabricator's quality-control and testing methods.

- 1. Allow testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with testing agency and provide samples of materials and concrete mixtures as may be requested for additional testing and evaluation.
- B. Testing: Test and inspect pole bases according to PCI MNL 116 requirements.
- C. Strength of pole bases will be considered deficient if units fail to comply with ACI 318 requirements for concrete strength.
- D. If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 requirements, employ a qualified 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 or, if units will be wet under service conditions, test cores after immersion in water in a wet 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 pole base comply with requirements, clean and dampen core holes and solidly fill with same precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.
- F. Defective Units: Discard and replace pole bases that do not comply with requirements, including strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be corrected, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, or sample panels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine subgrade conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance of the Work. Owner's Geotechnical Engineer or Owner's Testing Agency shall inspect subgrade prior to installing pole bases.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. Erect pole bases level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until backfill and compaction is complete.
 - 1. Remove projecting lifting devices and grout fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.
- B. Field cutting of pole bases is not permitted without approval of the Architect.
- C. Fasteners: Do not use drilled or powder-actuated fasteners for attaching accessory items to precast, prestressed concrete units.
- D. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.

3.3 ERECTION TOLERANCES

A. Erect pole base level, plumb, square, true, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 135.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Erection of pole bases.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Correct or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.

- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- F. Testing agency will prepare test and inspection reports.

3.5 CORRECTIVE WORK

- A. Correct pole bases if permitted by Architect.
 - 1. Corrective work may be permitted if structural adequacy, serviceability, durability, and appearance of units has not been impaired.
- B. Mix patching materials and correct units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and corrected work, when viewed in typical daylight illumination from a distance of 20 feet.
- C. Prepare and correct damaged galvanized coatings with galvanizing corrective 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 pole bases that cannot be corrected or when corrective work does not comply with requirements as determined by Architect.

3.6 CLEANING

- A. Clean grout, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
- B. 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 written 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 03 48 10

SECTION 04 20 00 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Concrete masonry units.
- 2. Decorative concrete masonry units.
- 3. Mortar and grout.
- 4. Steel reinforcing bars.
- 5. Masonry joint reinforcement.
- 6. Ties and anchors.
- 7. Embedded flashing.
- 8. Miscellaneous masonry accessories.

B. Products Installed but not Furnished under This Section:

- 1. Steel lintels in unit masonry.
- 2. Cavity wall insulation.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. CMUs.
 - 2. Portland cement.
 - 3. Hydrated lime.
 - 4. Portland cement-lime mix.

- 5. Aggregate for mortar.
- 6. Aggregate for grout.
- 7. Masonry joint reinforcement for single-wythe masonry.
- 8. Masonry joint reinforcement for multiwythe masonry.
- 9. Individual wire ties.
- 10. Anchors for CMU to existing masonry
- 11. Anchors for veneer to existing concrete or masonry, spiral type.
- 12. Adjustable anchors for connecting to structural steel framing.
- 13. Adjustable anchors for connecting to structural steel columns at isolated pilasters.
- 14. Adjustable anchors for connecting to concrete.
- 15. Joint stabilization anchors.
- 16. Wire mesh ties.
- 17. Adjustable masonry-veneer anchors.
- 18. Bond-breaker strips.
- 19. Reinforcing bar positioners.
- B. As-Specified Data: If the product to be incorporated into Project is as specified by manufacturer name and product designation in Part 2 of this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for item listed below, otherwise submit full Product Data for the following:
 - 1. Integral Water Repellant.
 - 2. Decorative CMU.
 - 3. Water Repellant Admixture.
 - 4. Flexible Flashing.
 - 5. Termination Bars.
 - 6. Compressible Filler.
 - 7. Preformed Control-Joint Gaskets.
 - 8. Weep / Cavity Vent Products.
 - 9. Cavity Drainage Material.
- C. Samples for Initial Selection:
 - 1. Decorative CMUs, in the form of small-scale units.
- D. Samples for Verification: For each type and color of the following:
 - 1. Decorative CMUs.

1.6 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - 2. Integral water repellant used in CMUs.
 - 3. Cementitious materials. Include name of manufacturer, brand name, and type.

- 4. Mortar Admixtures.
- 5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
- 6. Grout mixes. Include description of type and proportions of ingredients.
- 7. Reinforcing bars.
- 8. Joint reinforcement.
- 9. Anchors, ties, and metal accessories.
- B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
 - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Division 01 Section "Quality Requirements".
 - 1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 48 inches long by 48 inches high.
 - 2. Where masonry is to match existing, build 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.
 - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

1.8 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. Store preblended, dry mortar mix in delivery containers on elevated platforms; in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

- A. 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 of walls and hold cover securely in place.
 - 2. Where one 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.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. 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.

- D. 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.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. 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 and will be within 20 feet vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs 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.
 - 2. Provide square-edged units for outside corners unless otherwise indicated.
- B. Integral Water Repellent: Provide units made with integral water repellent for units exposed to the exterior and to other units where indicated.
 - 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514/E 514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- 1) BASF Corporation; MasterPel 240.
- 2) –GCP Applied Technologies, Inc..; Dry-Block Block Admixture.
- C. CMUs: ASTM C 90.
 - 1. Density Classification: Lightweight unless otherwise indicated.
 - 2. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
 - 3. Exposed Faces: Provide fine texture units suitable for painting.
- D. Decorative CMUs: ASTM C 90.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Nitterhouse Masonry Products, LLC; Split 8 Flute
 - 2. Density Classification: Normal weight.
 - 3. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph.
 - 4. Pattern and Texture:
 - a. Standard pattern, split-face finish.
 - b. Standard pattern, smooth-face finish, at concealed locations
 - c. Scored vertically so units laid in running bond appear as square units laid in stacked bond, standard finish.
 - 5. Colors: As selected by Architect from manufacturer's full range.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150 M, 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.
 - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

- E. Aggregate for Grout: ASTM C 404.
- F. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent by same manufacturer.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Corporation; MasterPel 240MA.
 - b. –GCP Applied Technologies, Inc.; Dry-Block Mortar Admixture.
- 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. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. 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. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
 - b. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
 - c. Wire-Bond; Figure 8 Rebar Positioner.
- D. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
 - 1. Interior Walls: Mill- galvanized, carbon steel.
 - 2. Exterior Walls: Stainless steel.
 - 3. Wire Size for Side Rods: 0.148-inch diameter.
 - 4. Wire Size for Cross Rods: 0.148-inch diameter.
 - 5. Wire Size for Veneer Ties: 0.187-inch diameter.
 - 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
 - 7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- E. Masonry Joint Reinforcement for Single-Wythe Masonry: Truss type with single pair of side rods.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; #120 Truss-Mesh Reinforcement.
 - b. Wire-Bond; Series 300 Truss 2 Wire Mesh Reinforcment.

- F. Masonry Joint Reinforcement for Multiwythe Masonry:
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; #170 Lox-All Truss Adjustable Eye-Wire.
 - b. Wire-Bond; Series 900 Level Eye Truss (Hook and Eye).
 - 2. Adjustable (two-piece) type, truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch and maximum vertical adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face.

2.5 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
- B. 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 A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
 - 2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304.
 - 3. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
 - 4. Stainless-Steel Sheet: ASTM A 666, Type 304.
 - 5. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Heckmann Building Products, Inc.; #262/263 Double Eye Rod Anchor and Double Pintle Tie.
 - b. Hohman & Barnard, Inc.; Adjustable Wall Tie.
 - 2. Where wythes do not align or are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches.
 - 3. Wire: Fabricate from 3/16-inch-diameter, hot-dip galvanized steel wire.
- D. Anchors for CMU to Existing Masonry
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Heckmann Building Products, Inc.; #187 Hole-Type Brick Veneer Anchor.

- b. Wire-Bond; Veneer Anchor Corrugated 2501.
- 2. Corrugated Buck Anchor: Minimum 16 gauge hot-dip galvanized corrugated steel plate anchor.
- E. Anchors for Veneer to Existing Concrete or Masonry, Spiral Type:
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Heckmann Building Products, Inc.; #391 Remedial Wall Tie.
 - b. Hohman & Barnard, Inc.; Spira-Lok.
 - 2. 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.
 - 3. Provide driven-in anchors designed for installation in drilled holes, relying on screw effect rather than adhesive to secure them to backup and veneer.
- F. 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. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; #359-C Weld-On Tie with Vee Byna-Tie.
 - b. Wire-Bond; Type I Weld-On Anchor with Triangular Tie 1100.
 - 2. Anchor Section for Welding to Steel Frame: Crimped minimum 1/4-inch-diameter, hot-dip galvanized steel wire.
 - 3. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, stainless steel wire.
- G. Adjustable Anchors for Connecting to Structural Steel Columns at Isolated Pilasters: Provide anchors that allow vertical adjustment.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; #345-BT Flexible Tie.
 - b. Wire-Bond; Dovetail Triangular Tie 2102.
 - 2. Anchor Section: Tab formed from 0.109-inch-thick stainless-steel sheet.
 - 3. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.187-inch-diameter, stainless-steel wire.

- H. Adjustable Anchors for Veneer Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; #305 Dovetail Slot with #315 Flexible Dovetail Brick Tie.
 - 2. Dovetail Slot: Dovetail slots with filler strips, 1" wide by 1" deep, fabricated from 0.034-inch, stainless steel sheet.
 - 3. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.109-inch- thick stainless-steel sheet.
 - 4. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, stainless-steel wire.
- I. Joint Stabilization Anchors: Provide anchors allowing lateral movement, made from stainlesssteel.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Heckmann Building Products Inc.; #353 Debonded Shear Anchor.
 - b. Hohmann & Barnard, Inc.; Slip-Set Stabilizer.
 - c. Wire-Bond; #1700 Control Joint Anchor.
- J. Adjustable Masonry-Veneer Anchors:
 - 1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch
 - 2. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a corrosion-resistant, self-drilling, eye-screw designed to receive wire tie. Eye-screw has spacer that seats directly against framing and is same thickness as sheathing and has gasketed washer head that covers hole in sheathing.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Heckmann Building Products Inc.; Pos-I-Tie with Pos-I-Tie ThermalClip and Double Pintle Wire Tie.
 - 2) Hohmann & Barnard, Inc.; 2-Seal Thermal Wing Nut AnchorTie with Adjustable Wall Tie (pintle).
 - 3) Wire-Bond; SureTie 4520 and SureTie triangle 4510.
 - b. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.187-inch- diameter, stainless-steel wire.

2.6 EMBEDDED FLASHING MATERIALS

- A. Flexible Flashing: Use the following unless otherwise indicated:
 - 1. Copper-Laminated Flashing: 5-oz./sq. ft. copper sheet bonded between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Advanced Building Products Inc.; Copper Sealtite 2000.
 - 2) York Manufacturing, Inc.; Multi-Flash 500.
- B. Termination Bars: Stainless steel bar 1/8-inch by minimum 1-inch, for attachment at 8-inch centers with stainless steel fasteners.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; #T1 Termination Bar.
- 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.

2.7 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.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; NS Closed Cell Neoprene Sponge.
 - b. Wire-Bond; Expansion Joint 3300.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; RS Series Rubber Control Joint.
 - b. Wire-Bond; Rubber Control Joint.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

- D. Weep/Cavity Vent Products: Use the following unless otherwise indicated:
 - 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, 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.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Advanced Building Products Inc.; Mortar Maze Cell Vents.
 - 2) Heckmann Building Products Inc.; #85 Cell Vent.
 - 3) Hohmann & Barnard, Inc.; QV Quadro-Vent.
 - 4) Wire-Bond; Cell Vent 3601.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity. See the Evaluations.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hohmann & Barnard, Inc.; Mortar Web.
 - b. Wire-Bond; Cavity Net.
 - 2. Configuration: Provide one of the following:
 - a. Strips, full-depth of cavity and 10 inches high, with dovetail shaped notches 7 inches deep that prevent clogging with mortar droppings.
 - b. Strips, not less than 3/4 inch thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

2.8 WATER-REPELLENT TREATMENTS

A. Water-Repellent Treatment: Clear, penetrating water-repellent treatment compatible with, and intended for use with, CMUs containing integral water repellent and mortar with water-repellent admixture.

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 mortar unless otherwise indicated.

- 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 C 270, either the Proportion Specification or the Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For concrete masonry unit backup in exterior walls, masonry bearing walls, shear walls and masonry below grade or in contact with earth, use Type S. Not for use in masonry veneer construction.
 - 2. Use Type N mortar in all masonry veneer construction and in all masonry construction other than noted in the requirements for Type S mortar above.
- 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 TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
 - 3. 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 the Work.
 - 1. Verify that foundations are within tolerances specified.
 - 2. Verify that reinforcing dowels are properly placed.
 - 3. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

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 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.
- E. 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.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

3.3 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 ½-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 ½-inch maximum.
- 3. For vertical lines and surfaces, do not vary from plumb by more than ½ inch in 10 feet, 3/8 inch in 20 feet, or ½-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, ½ inch in 20 feet, or ½-inch maximum.
- 5. For lines and surfaces, do not vary from straight by more than ¼ inch in 10 feet, 3/8 inch in 20 feet, or ½-inch maximum.

6. 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.

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 exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
- 3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
- 4. 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.
- 5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 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. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping 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.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. 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.
- H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

- I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
 - 1. Install compressible filler in joint between top of partition and underside of structure above.
 - 2. Fasten top-of-wall wind clips to structure above and build wall into clips. Grout cells of CMUs solidly and space clips as indicated on Drawings.
 - 3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 07 Section "Fire-Resistive Joint Systems."

3.5 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.
 - 5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.
- 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 where indicated to receive air barriers unless otherwise indicated.

3.6 COMPOSITE MASONRY

- A. Bond wythes of composite masonry together using the following method:
 - 1. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Use adjustable (two-piece) type reinforcement.
- B. Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid and shoving units of other wythe into place.
- C. Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.
 - 1. Provide continuity with masonry-joint reinforcement at corners by using prefabricated L-shaped units as well as masonry bonding.

- D. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
 - 1. Provide continuity with masonry-joint reinforcement by using prefabricated T-shaped units.

3.7 CAVITY WALLS

- A. Bond wythes of cavity walls together using one of the following methods:
 - 1. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Use adjustable (two-piece) type reinforcement.
 - 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. Apply air barrier to face of backup wythe to comply with Division 07 Section "Fluid-Applied Membrane Air Barriers."
- D. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
 - 1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.8 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
 - 1. Fasten screw-attached anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
 - 2. Embed connector sections and continuous wire in masonry joints.
 - 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.

- 4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.
- B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.
 - 1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.9 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.
 - 1. Space reinforcement not more than 16 inches o.c.
 - 2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- 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.

3.10 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 2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally.

3.11 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.

- 1. Locate joints as indicated on Drawings; however, locate vertical joints not more than 20 feet o.c. for expansion joints in masonry veneer and 24 feet o.c. for control joints in concrete masonry.
- B. Form control joints in concrete masonry as follows:
 - 1. Install preformed control-joint gaskets designed to fit standard sash block.
 - 2. At steel columns construct control-joint according to Drawings.

3.12 LINTELS

- A. Install steel lintels where indicated.
- B. Provide lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
- C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated. Jambs below bearing to be grouted solid from base of wall to underside of lintel bearing.

3.13 FLASHING, WEEP HOLES, AND CAVITY 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. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
 - 1. 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 at least 2 inches above top of cavity drainage material.
 - 3. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; and at least 2 inches above the top of cavity drainage material.
 - 4. Secure top of flashing with metal termination bar attached to wall framing 8 inches on center. Apply a continuous bead of compatible sealant to the top of the bar.
 - 5. 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.
 - 6. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

- C. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
 - 1. Use specified weep/cavity vent products to form weep holes.
 - 2. Space weep holes 24 inches o.c. unless otherwise indicated.
- D. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

3.14 REINFORCED UNIT MASONRY INSTALLATION

- A. Placing Reinforcement: Comply with requirements in TMS 602ACI 530.1/ASCE 6.
- B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in 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.

3.15 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: Level Bspecial inspections according to the ACI 530.
 - 1. Begin masonry construction only after inspectors have verified proportions of siteprepared 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. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- F. Inspect reinforcing for size and placement prior to pouring of grout.
- G. Inspect grout and mortar mixing operations to ensure mix proportions and procedures comply with specified requirements.
- H. Inspect ties and anchors for type, spacing, and proper installation.
- I. Inspect flashing and accessories for type and proper installation.

J. Inspect all aspects of masonry construction operations for compliance with specified cold weather and/or hot weather procedures.

3.16 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, 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:
 - 1. 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 applicable cleaning methods indicated in NCMA TEK 8-4A.
 - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

END OF SECTION 04 20 00

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Structural steel.
- 2. Primer.
- 3. Grout.

1.3 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Architecturally Exposed Structural Steel: Structural steel designated as "architecturally exposed structural steel" or "AESS" on Drawings.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Provide details of simple shear connections required by the Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering design by a qualified professional engineer (licensed in the State of New York), to withstand loads indicated, comply with other information and restrictions indicated, and certifying that the design is in compliance with the Building Code of New York.

1.5 SUBMITTALS

A. Action Submittals:

- 1. Product Data: For each type of product indicated.
 - a. Tension-control, high-strength bolt-nut-washer assemblies
 - b. Zinc-coated tension-control, high-strength bolt-nut-washer assembliesUnheaded anchor rods
 - c. Post-installed Anchors
 - d. Grout

- 2. Shop Drawings: Show fabrication of structural-steel components.
 - a. Anchor Rod/Embedded Item Layout Plans and Details: Show anchor rod layout, dimensions, elevation, orientation and details of anchor rods, leveling plates and other items embedded in concrete.
 - 1) Submit anchor rod/embedded item plans and obtain Architect's approval prior to submitting erection plans.
 - b. Erection Plans and Details: Include member layout, dimensions, elevations, member sizes, erection details, and all information required for erection.
 - 1) Submit erection plans and obtain Architect's approval prior to submitting fabrication details.
 - c. Fabrication Details: Submit drawings indicating all details necessary for shop fabrication and erection of each individual steel member.
 - 1) Detail simple shear connections to withstand loads indicated and comply with other information and restrictions indicated.
 - a) Select and complete connections using AISC 360 and LRFD.
 - b) Provide connections, at a minimum, sized for beam end reactions shown on Drawings and per Tables 10-1, 10-2, 10-3 or 10-4, AISC Steel Construction Manual. Unless otherwise noted, beam end reactions are given at factored load level.
 - 2) Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 3) Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4) Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

B. Informational Submittals:

- 1. Mill test reports for structural steel, including chemical and physical properties.
- 2. Product Test Reports: For the following:
 - a. Tension-control, high-strength bolt-nut-washer assemblies.
 - b. Nonshrink grout.

C. Closeout Submittals:

1. Record Drawings: Provide complete set of erection and fabrication drawings with all construction changes incorporated.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD is preferred. At least 10 projects completed of a similar size and scope to Project.
 - 1. If fabricator is not designated an AISC-Certified Plant, see Source Quality Control Article for Contractor responsibilities.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
- C. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
- D. Structural Preconstruction Conference: Attend conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.8 COORDINATION

A. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels: ASTM A 572/A 572M, Grade 50.
- C. Angles, Plate and Bar: ASTM A 36/A 36M.
- D. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers with plain finish.
- B. Zinc-Coated Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers. For exposed exterior structural steel and structural steel in moist environments connections only.
 - 1. Finish: Hot-dip or mechanically deposited zinc coating.
- C. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
 - 1. Configuration: Hooked.
 - 2. Nuts: ASTM A 563 heavy-hex carbon steel.
 - 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 4. Washers: ASTM F 436, Type 1, hardened carbon steel.
 - 5. Finish: Plain.
- D. Postinstalled Anchors: chemical anchors.
 - 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. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
 - 3. Chemical Anchor Adhesives: Heavy duty, two component injectable adhesive designed to be dispensed using double chamber gun with mixing nozzle. Adhesives in capsule form will not be accepted.
 - a. Products for anchoring into concrete: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti, Inc.; Hit-HY 200; Hit-Ice.
 - 2) ITW Redhead; Epcon C6; Epcon A7.
 - 3) Powers Fasteners, Inc.; AC100+ Gold.

- b. Products for anchoring into masonry: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti, Inc.; Hit-HY 70.
 - 2) ITW Redhead; Epcon C6; Epcon A7.
 - 3) Powers Fasteners, Inc.; AC100+ Gold.

2.3 PRIMER

- A. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
- B. Provide primers that comply with Division 09 Sections "Painting" and "High Performance Coatings" and the following:
 - 1. Interior Structural Steel: Refer to First Coat for Steel, Structural Steel in Interior High-Performance Coating Schedule: General Use.
 - 2. Exposed Exterior Structural Steel: Refer to First Coat for Steel Substrates in Exterior High-Performance Coating Schedule.

2.4 GROUT

A. Grout: ASTM C 1107, factory-packaged, shrinkage-resistant, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.
 - 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
 - 4. Mark and match-mark materials for field assembly.
 - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces. Holes to be standard holes unless shown otherwise on Drawings.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.
- G. Architecturally Exposed Structural Steel: Fabricate to the requirements of AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened or pretensioned and slip critical where indicated on Drawings.
- 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.

2.7 SHOP PRIMING

- A. Shop prime the following structural steel members only:
 - 1. Interior structural steel exposed to view, and interior lintels.
 - 2. Structural steel in exterior walls and lintels in exterior walls.
 - 3. Exposed exterior structural steel.
- B. For members to receive primer leave following locations unprimed:
 - 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 to be high-strength bolted with slip-critical connections.
 - 4. Galvanized surfaces unless noted to be primed.
- C. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to Division 09 Sections "Painting" and "High Performance Coatings".

D. Priming:

- 1. Immediately after surface preparation, apply one coat of primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness as listed below. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
- 2. Stripe paint corners, crevices, bolts, welds, and sharp edges.
- 3. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: If fabricator is not designated an AISC-Certified Plant then the Contractor shall engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Shop welds will be visually inspected according to AWS D1.1/D1.1M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 - 1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
 - 1. Do not remove temporary shoring supporting composite deck construction until cast-inplace concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing 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 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 shrinkage-resistant grouts.
- C. Column Base Plates and Anchor Bolts: Not designed to resist lateral loads and overturning during erection; base plates and anchor bolts are designed only to comply with the minimum requirements of the OSHA "Safety Standards for Steel Erection".
- D. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- E. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- F. Splice members only where indicated.
- G. Do not use thermal cutting during erection.

- H. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- I. Architecturally Exposed Structural Steel: Erect to the requirements of AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened or pretensioned and slip critical where indicated on Drawings.
- 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 AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform tests and inspections as described below.
- B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
- D. Postinstalled Chemical Anchors: Test 5% of all chemical anchors in tension, randomly selected but in varied locations. Testing to be in accordance with ASTM E 488 to the approved manufacturer's allowable loads. Concrete or masonry wall must cure a minimum of 3 days prior to testing. Do not test anchors until after the anchor manufacturer's recommended curing time. If an anchor fails during this test additional anchors may be requested to be tested as directed by the Architect.
- E. Record position and alignment of erected steel. Compare with required tolerances.
- F. Verify compliance with details shown on approved drawings such as bracing, stiffening, member location, and proper application of joint details at each connection.
- G. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Field Corrections: Do not field correct any framing member or connection without prior approval of Architect. Submit detail of proposed field correction to Architect including component sizes, dimensions, weld sizes, cut locations, etc.

END OF SECTION 05 12 00

SECTION 05 31 00 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof deck.
 - 2. Composite floor deck.
 - 3. Accessories.

1.3 DEFINITIONS

A. Moist Environment: Areas indicated as "Moist Environment" on Drawings. Moist environment areas require special finishing.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for each type of deck, accessory, and product indicated.
 - 1. Deck Primer Test Reports: Provide documentation of primer compatibility with finish paint.

B. Shop Drawings:

 Deck Placement Drawings: Include layout and types of deck panels, support locations, anchorage details, dimensions, panel lengths, edge of deck or pour stop distance and each condition requiring closure panels, reinforcing channels, cut deck openings, special jointing, accessories including rubber flute closure locations, and attachments to other construction.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of steel deck.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 - 1. Power-actuated mechanical fasteners.

1.7 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

B. Qualifications:

- 1. Fabricator:
 - a. Submit documentation showing at least 5 completed projects of similar size and scope.
 - b. Submit documentation showing current membership with Steel Deck Institute (SDI).

2. Installer:

- a. Submit documentation showing at least 5 completed projects of similar size and scope.
- C. Structural Preconstruction Conference: Attend conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck off the ground on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
- C. Do not place deck bundles on unbolted structural steel frames, or on unattached or unbridged joists. Do not place bundles on unbraced structural frame.

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."

- B. Fire-Resistance Ratings: Comply with ASTM E 119; testing 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.

2.2 ROOF DECK

- A. Roof Deck: Design and 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. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
 - 2. Deck Profile: Type WR, wide rib.
 - 3. Profile Depth: As indicated on Drawings.
 - 4. Design Uncoated-Steel Thickness: As indicated on Drawings.
 - 5. Span Condition: Triple span or more, unless otherwise shown on Drawings.
 - 6. Side Laps: Flat overlapped, except at areas where deck is exposed to public view, provide interlocking seam.

2.3 COMPOSITE FLOOR DECK

- A. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
 - 1. Galvanized and Shop-Primed Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33; G90 zinc coating; cleaned, pretreated, and primed with manufacturer's special, high performance baked-on, rust-inhibitive primer compatible with galvanized coating.
 - a. Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
 - b. Primer to be compatible with finish paint. Primer to be approved for use with finish paint or be tested prior to use.
 - 2. Color: Manufacturer's standard.Profile Depth: As indicated on Drawings.
 - 3. Design Uncoated-Steel Thickness: As indicated on Drawings.
 - 4. Span Condition: Triple span or more, unless otherwise shown on Drawings.

2.4 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, carbon-steel, self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 20 gauge (0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- E. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- G. Galvanizing Repair Paint: ASTM A 780.
- H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, approved deck placement shop drawings and requirements in this Section.
- B. Locate deck bundles to prevent overloading of structural members.
- C. Do not use deck units for storage or working platforms until permanently secured in position.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened.

- E. Place deck panels flat and square and fasten to supporting frame without warp or excessive deflection. Do not stretch or contract side lap interlocks.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck. Provide neat, square and trim cuts.
- G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work. Welding shall be in accordance with AWS D1.1 and D1.3.

3.3 ROOF-DECK INSTALLATION

- A. Permanently fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
 - 1. Weld Diameter: 5/8 inch, nominal.
- B. Side-Lap and Perimeter Edge Fastening:
 - 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 - 2. Fasten with a minimum of 1-1/2-inch- long welds for deck is exposed to public view.
- C. Fastening Spacing: Provide fasteners at no greater than maximum spacing listed in the table below. Weld intermediate and end supports of deck units with a minimum of two welds per deck unit at each support. Fasten side-laps at intervals not exceeding the lesser of 1/2 of the span or per the table below.

		Intermediate	F	End	* Edge	Side
	Deck	Supports	S	Supports	Supports	Laps
	Designation	(inches)	(inches)	(inches)	(inches)
1.	WR	6	6	12	12	

- D. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
 - 1. End Joints: Lapped 2 inches minimum for WR and DR deck Butted for LS and cellular deck.
- E. Reinforcement at Openings: For openings less than 13 inches in any dimension not reinforced with supplemental structural framing, provide additional metal reinforcement and closure pieces as required for strength and continuity of decking, and support of other work.
 - 1. Reinforce roof deck with flat sheet steel placed over opening and fastened to top of deck.
 - a. For openings up to 6 inches in diameter, no reinforcing is necessary.
 - b. For openings 6 inches to 8 inches in diameter, provide no less than nominal 0.045 inch (18 gauge) thick before coating, and at least 12 inches wider and longer than opening.

- c. For openings 8 inches to 13 inches in diameter, provide no less than nominal 0.057 inch (16 gauge) thick before coating, and at least 12 inch wider and longer than opening.
- 2. Fasten using one No. 10 screw at each corner, at each up-flute and spaced not more than 12 inches along each side.
- F. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, flat plates at change of deck direction, butt strips, finish strips, end closures, and reinforcing channels and all other miscellaneous shapes as shown on plans according to deck manufacturer's written instructions, and as required to provide suitable surface for application of roof insulation and roof covering. Fasten with No. 10 screws at 12 inches maximum to provide a complete deck installation.
- G. Roof Insulation Support: Provide and install metal accessories to provide suitable surface for application of insulation.

3.4 FLOOR-DECK INSTALLATION

- A. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.
- B. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
 - 1. Weld Diameter: 3/4 inch, nominal. Where two units abut, fasten each unit to steel framing separately.
 - 2. Weld Spacing: End and intermediate supports perpendicular to deck flutes: 12 inches o.c.
- C. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of half of the span or 36 inches, and as follows:
 - 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 - 2. Mechanically clinch or button punch.
 - 3. Fasten with a minimum of 1-1/2-inch- long welds.
- D. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with butted end joints.
- E. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- F. 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.
- G. Deck Accessories to Supporting Members: Fasten in accordance with manufacturer's recommendations.

H. Deck Openings: Cut and reinforce all holes or openings in floor as shown on manufacturer's placement drawings.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Field Inspections:

- 1. Material Inspection: Select six (6) random sheets for each type of deck used. Inspect for thickness, type and material.
- 2. Fastening Inspection: Inspect welds and side lap fasteners over entire deck area for size and spacing and weld quality.
- 3. Roof Deck Conditions Inspection: Before installation of roof insulation and roof covering, inspect the deck for tears, dents or other damage that may prevent the deck from supporting the required loads, or be visually objectionable in exposed deck areas. Report suspect areas to Architect to determine need for repair or replacement.
- 4. Floor Deck Conditions Inspection: Before concrete placement, inspect the deck for tears, dents or other damage that may prevent the deck from acting as a tight and substantial form. Inspect deck for dirt, ice, water, oils or other materials that could prevent or inhibit composite action forming between deck and hardened concrete. Report suspect areas to Architect to determine need for repair, replacement or cleaning.
- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.6 PROTECTION

- A. Hanging Loads (All Contractors): Do not hang any concentrated loads from metal deck unless otherwise noted and detailed on Drawings.
- B. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- C. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on top surface of prime-painted deck immediately after installation, and apply repair paint.
 - 1. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Division 09 Section.

- D. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.
- E. Do not use deck units for storage or working platforms until permanently secured.

END OF SECTION 05 31 00

SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following cold-formed metal framing ("CFMF") elements:
 - 1. Ceiling joist and soffitframing.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.
- B. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads and all combinations of these loads, as required by applicable codes and as specified on Drawings, within limits and under conditions indicated.
 - 1. Design Loads: As indicated on Drawings.
 - a. Dead Loads: Weights of materials and construction.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Ceiling Joist and Soffit Framing: Vertical deflection of 1/360 of the span.
 - 3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
 - 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 3/4 inch.

- C. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing General Provisions."
 - 1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing Header Design."
- D. Minimum Thickness and Maximum Spacing Requirements: Comply with the requirements of this specification for specific requirements for minimum thickness and maximum spacing for cold-formed metal framing components.

1.4 SUBMITTALS

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

B. Action Submittals:

- 1. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- 2. 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.
 - a. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Informational Submittals:

- 1. 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:
 - a. Steel sheet.
 - b. Expansion anchors.
 - c. Power-actuated anchors.
 - d. Mechanical fasteners.
 - e. Vertical deflection clips.
 - f. 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 (licensed in the State of New York) responsible for their preparation certifying that the design is in compliance with the Building Code of New York.

- B. Cold-formed Metal Framing Installer Qualifications: At least 5 years experience in construction of cold-formed metal framing systems similar in scope to application shown on Documents with record of successful in-service performance for prior projects.
- C. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, 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. Structural Preconstruction Conference: Attend conference at Project site.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Deliver materials and components to Site in manufacturer's unopened packages, containers or bundles, fully identified with brand name, type, grade and identification of manufacturer or supplier.
- B. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- C. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:
 - 1. AllSteel Products, Inc.
 - 2. ClarkWestern Building Systems, Inc.
 - 3. Dietrich Metal Framing; a Worthington Industries Company.
 - 4. MarinoWare; a division of Ware Industries.
 - 5. MBA Building Supplies, Inc.
 - 6. Super Stud Building Products, Inc.

- 7. United Metal Products, Inc.
- 8. Telling Industries, LLC.

2.2 MATERIALS

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G60, A60, AZ50, or GF30.

2.3 CEILING JOIST AND SOFFIT FRAMING

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 33 mils.
 - 2. Minimum Flange Width: 2 inches.

2.4 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.
 - 7. Gusset plates.
 - 8. Stud kickers, knee braces, and girts.
 - 9. Joist hangers and end closures.
 - 10. Hole reinforcing plates.
 - 11. Backer plates.

2.5 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight matching associated member.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A 780.
- B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.
- C. Shims: Load bearing, high-density multimonomer plastic, nonleaching.
- D. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.7 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

- 4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- 5. Splices in axially loaded members not acceptable.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.
- D. Touch-up all welds with galvanizing primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Install load bearing shims or grout between the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations to ensure a uniform bearing surface on supporting concrete or masonry construction.
- B. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing General Provisions", manufacturer's written instructions, Drawings, and approved Shop Drawings unless more stringent requirements are indicated.

- C. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- 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 comparable in intensity 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 and control joints with cold-formed metal framing. Independently frame both sides of joints.
- G. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing 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 standard punched openings.
- I. Erection Tolerances: Install cold-formed metal 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.

3.4 CEILING JOIST AND SOFFIT INSTALLATION

- A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on approved Shop Drawings.
- B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
 - 1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
 - 2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on approved Shop Drawings.

- C. Space joists not more than 2 inches from abutting walls, and as follows:
 - 1. Joist Spacing: As indicated on approved Shop Drawings.
- D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists as indicated on approved Shop Drawings.
- E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated on approved Shop Drawings.
 - 1. Install web stiffeners to transfer axial loads of walls above.
- F. Install bridging at intervals indicated on approved Shop Drawings. Install prior to application of loads. Fasten bridging at each joist intersection.
 - 1. Bridging may be one of the following:
 - a. Joist-track solid blocking of width and thickness indicated, secured to joist webs.
 - b. Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.
 - 2. Provide end blocking where joist/rafter ends are not restrained against rotation.
- G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.
- H. Provide additional joist under parallel, non-load bearing partitions when partition length exceeds one half span.
- I. Do not install web knock-outs within 1.5 times depth of member from edge of bearing, unless necessary. Where required, reinforce web.
- J. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

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. Contractor to provide access to construction for inspections to verify conformance with provisions of Contract Documents and approved Shop Drawings. Inspections to include but not limited to, the following:
 - 1. Verify member sizes, configuration and spacing.
 - 2. Inspect screwed and welded connections.
 - 3. Inspect weld quality.
 - 4. Verify field welder's certification.

- 5. Verify galvanizing primer has been applied to all welds and damaged galvanized surfaces.
- 6. Verify compliance with details shown on approved drawings such as bracing, stiffening, member location, and proper application of joint details at each connection.
- 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. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel framing and supports for mechanical and electrical equipment.
 - 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
- B. Products furnished, but not installed, under this Section:
 - 1. Anchor bolts indicated to be cast into concrete or built into unit masonry.

1.3 PERFORMANCE REQUIREMENTS

A. 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.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Slotted channel framing.
 - 2. Metal nosings and treads.
 - 3. Grout.
- B. Shop Drawings: Show fabrication and installation details for metal fabrications.
 - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."

1.7 COORDINATION

A. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

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.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.
- D. Zinc-Coated Steel Wire Rope: ASTM A 741.
 - 1. Wire-Rope Fittings: Hot-dip galvanized-steel connectors with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.
- E. 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 drawings.
 - 2. Material: Galvanized steel, ASTM A 653/A 653M, structural steel, Grade 33, with G90 coating; 0.108-inch nominal thickness.
 - 3. Fasteners and Fittings: Appropriate to situation and as recommend by manufacturer.

2.3 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.

- B. Post-installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 unless otherwise indicated.
 - 2. Chemical Anchor Adhesives: Heavy duty, two component injectable adhesive designed to be dispensed using double chamber gun with mixing nozzle. Adhesives in capsule form will not be accepted.
 - a. Products for anchoring into concrete: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti, Inc.; Hit-HY 200; Hit-Ice.
 - 2) ITW Redhead; Epcon C6; Epcon A7.
 - 3) Powers Fasteners, Inc.; AC100+ Gold.
 - b. Products for anchoring into masonry: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti, Inc.; Hit-HY 70.
 - 2) ITW Redhead; Epcon C6; Epcon A7.
 - 3) Powers Fasteners, Inc.; AC100+ Gold.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Primer:
 - 1. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
 - 2. Provide primers that comply with Division 09 Section "High Performance Coatings" and the following:
 - a. Interior Structural Steel: Refer to First Coat for Steel, Structural Steel in Interior High-Performance Coating Schedule: General Use.
 - b. Exposed Exterior Structural Steel: Refer to First Coat for Steel Substrates in Exterior High-Performance Coating Schedule.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with ASTM A780/A780M and compatible with paints specified to be used over it.
- D. 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.

- E. Concrete: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.
- F. Isolation Barrier membrane: Self-adhering, high-temperature sheet, minimum 15 mils thick, consisting of cross-laminated polyethylene-film top surface laminated to layer of butyl adhesive, with release-liner backing; cold applied, in roll width to match or exceed width of area to be protected. Provide primer when recommended by membrane manufacturer.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Grace Construction Products, a unit of W. R. Grace & Co.; "Vycor Pro".
 - b. Equivalents meeting requirements of specified products.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. 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 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 with accurate angles and surfaces and straight edges.
- E. 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 so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
 - 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

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.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Fabricate supports for operable partitions from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

2.7 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.

2.8 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.
- C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.9 STEEL AND IRON FINISHES

- A. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to Division 09 Section "High Performance Coatings".
 - 1. For galvanized surfaces noted to be painted, comply with ASTM D 6386, "Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting".

- B. 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.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Metal Fabrications: For all iron and steel items (except those noted below), shop prime with alkyd primer.
 - 2. Exterior Wall Metal Fabrications: For all iron and steel items occurring in exterior walls, shop prime with urethane primer.
 - 3. Exposed Exterior Metal Fabrications: For all iron and steel items exposed on the exterior, shop prime with zinc-rich primer.
- D. Shop Priming: Immediately after surface preparation, apply one coat of primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness as listed below. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 - 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.
- B. 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.
- C. 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.
- D. 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.
- E. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- F. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- G. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Extruded Aluminum: Isolation barrier membrane.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for operable partitions securely to and rigidly brace from building structure.
- C. Install slotted channel framing with manufacturer recommended fasteners and fittings and follow manufacturer recommended instructions.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 Section "High-Performance Coatings."
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05 50 00

SECTION 05 52 16 - TUBE RAILINGS (STEEL)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel tube railings and gates.
 - 2. Steel fittings, brackets, and other railing accessories.

1.3 COORDINATION

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages. 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.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Steel tube.
 - 2. Fasteners.
 - 3. Railing brackets, flanges, fittings, and anchors.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 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: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.2 STEEL AND IRON

- A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- B. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

2.3 FASTENERS

- A. General: Provide the following:
 - 1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.
- 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. Fasteners for Interconnecting Railing Components:
 - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
 - 2. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.
- D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
 - 1. Material Where Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

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 Division 09 Section "High-Performance Coatings."
- C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonexpanding, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 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.
 - 1. Gates: Form gates from steel tube of same size as top rails, with infill to match railings, unless otherwise indicated. Provide self-closing hinges and overlapping stop with rubber bumper to prevent gate from opening in direction opposite egress.
- B. Shop assemble railings 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. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- F. Connections: Fabricate railings with welded connections unless otherwise indicated.
- G. 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.
 - 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 flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- H. Form Changes in Direction as Follows:
 - 1. By bending.

- I. For changes in direction made by bending, use 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.
- J. Close exposed ends of railing members with prefabricated end fittings.
- K. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns.
- L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
- M. 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.
- N. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.6 STEEL AND IRON FINISHES

- A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.
- B. Shop Priming: Comply with requirements in Division 09 Section "High-Performance Coatings."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

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 are 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. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- 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 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components, unless otherwise indicated. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

3.4 ANCHORING POSTS

A. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as indicated.

3.5 ATTACHING RAILINGS

- A. Attach railing gates level, plumb, and secure for full opening without interference.
 - 1. Attach hardware using tamper-resistant or concealed means.
 - 2. Adjust hardware for smooth operation.

3.6 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 Section "High-Performance Coatings."

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer.

END OF SECTION 05 52 16

SECTION 05 53 13 - BAR GRATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal bar gratings.

1.3 COORDINATION

A. 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.

1.4 SUBMITTALS, GENERAL

- A. General: Submit all action submittals required by this Section concurrently.
- B. Action submittals
 - 1. Product Data: For the following:
 - a. Welded bar gratings.
 - b. Clips and anchorage devices for gratings.
 - c. Galvanizing repair paint.
 - 2. Shop Drawings: Include plans, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication.

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. Borden Metal Products (Canada) Limited.
 - 2. Fisher & Ludlow.
 - 3. Harsco Industrial IKG, a division of Harsco Corporation.
 - 4. MLP Steel Company; Laurel Steel Products Division.

2.2 METAL BAR GRATINGS

- A. Metal Bar Grating Standards: Comply with NAAMM MBG 531, "Metal Bar Grating Manual."
- B. Welded Steel Grating:
 - 1. Grating Mark W-19-4 (2 x 1/4) STEEL: 2-by-1/4-inch bearing bars at 1-3/16 inches o.c., and crossbars at 4 inches o.c.
 - 2. Traffic Surface: Serrated.
 - 3. Steel Finish: Hot-dip galvanized with a coating weight of not less than 1.8 oz./sq. ft. of coated surface.
- C. Band Bars: Weld 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.

2.3 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.

2.4 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.
- 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. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts, and, where indicated, flat washers; ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group 2.
 - 1. Material for Interior Locations: Carbon-steel components are zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
- D. Plain Washers: Round, ASME B18.22.1.
- E. Lock Washers: Helical, spring type, ASME B18.21.1.

2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy that is welded.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

2.6 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:
 - 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.
- 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.
 - 1. 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.

- G. 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.
- H. Do not notch bearing bars at supports to maintain elevation.

2.7 STEEL FINISHES

- A. Finish gratings, frames, and supports after assembly.
- B. 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 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 AWS recommendations and 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.

3.3 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.

3.4 ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 05 53 13

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Preservative-treated lumber.
- 2. Fire-retardant-treated lumber and plywood.
- 3. Miscellaneous lumber.
- 4. Fasteners.

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site
 - 1. Preservative-Treated Lumber:
 - a. Include data for preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

- 2. Fire-Retardant Treated Lumber and Plywood:
 - a. 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 based on testing by a qualified independent testing agency.
 - b. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
- 3. Miscellaneous lumber (non-treated).
- 4. Fasteners.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fireretardant 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.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber and plywood flat with spacers beneath and between each bundle to provide air circulation. Protect lumber and plywood from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PRESERVATIVE-TREATED LUMBER

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
 - 3. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
 - 4. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
 - a. Hem-fir (north); NLGA.

- b. Mixed southern pine or southern pine; SPIB.
- c. Spruce-pine-fir; NLGA.
- d. Hem-fir; WCLIB or WWPA.
- e. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- 5. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- B. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- D. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- E. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.2 FIRE-RETARDANT-TREATED LUMBER AND PLYWOOD

- A. General: 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. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
 - 3. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
 - 4. Dimension Lumber Items: Construction or No. 2 grade.
 - a. Species:
 - 1) Hem-fir (north); NLGA.

- 2) Southern pine; SPIB.
- 3) Douglas fir-larch; WCLIB or WWPA.
- 4) Spruce-pine-fir; NLGA.
- 5) Douglas fir-south; WWPA.
- 6) Hem-fir; WCLIB or WWPA.
- 7) Douglas fir-larch (north); NLGA.
- 8) Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- C. Plywood: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.
- D. 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 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.
 - 3. 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.
- E. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- F. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- G. Application: Treat items indicated on Drawings, and the following:
 - 1. Concealed blocking.
 - 2. Plywood backing panels.

2.3 MISCELLANEOUS LUMBER (NON-TREATED)

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.

- 3. Furring.
- 4. Grounds.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine or southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.
 - 4. Hem-fir; WCLIB or WWPA.
 - 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
 - 1. Mixed southern pine or southern pine; No. 3 grade; SPIB.
 - 2. Hem-fir or hem-fir (north); Standard or No. 3 Common grade; NLGA, WCLIB, or WWPA.
 - 3. Spruce-pine-fir (south) or spruce-pine-fir; Standard or No. 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.4 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough 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, 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. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC193 as appropriate for the substrate.
 - 1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- E. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
- F. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in building Code in effect for Project.
 - 2. ICC-ES evaluation report for fastener.
- I. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or 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.
 - 1. Provide 1/4-inch vent space between each length of blocking.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

END OF SECTION 06 10 00

SECTION 06 10 26 - ROOFING ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Preservative-treated lumber and plywood.
- 2. Fire-retardant-treated plywood roof sheathing.
- 3. Rooftop equipment bases and support curbs.
- 4. Roof wood blocking and nailers.
- 5. Fasteners.
- 6. Adhesives.
- 7. Isolation barrier membrane.

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 1. Preservative-Treated Lumber and Plywood:
 - a. Include data for preservative treatment from chemical treatment manufacturer and certification by treating plant that treated lumber and plywood comply with requirements. Indicate type of preservative used and net amount of preservative retained

2. Fire-Retardant Treated Plywood:

- a. 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 based on testing by a qualified independent testing agency.
- b. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
- 3. Fasteners.
- 4. Adhesives.
- 5. Isolation barrier membrane.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fireretardant 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.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber and plywood flat with spacers beneath and between each bundle to provide air circulation. Protect lumber and plywood from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PRESERVATIVE-TREATED LUMBER AND PLYWOOD

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
 - 3. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

- 4. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
 - a. Hem-fir (north); NLGA.
 - b. Mixed southern pine or southern pine; SPIB.
 - c. Spruce-pine-fir; NLGA.
 - d. Hem-fir; WCLIB or WWPA.
 - e. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- 5. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- B. Plywood: DOC PS 1, Exterior A-C, unless otherwise indicated.
- C. Preservative Treatment by Pressure Process for Lumber and Plywood: AWPA U1; Use Category UC3b for exterior construction not in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- D. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- E. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review. Mark plywood with treatment quality mark of an inspection agency acceptable to authorities having jurisdiction.
- F. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.2 FIRE-RETARDANT-TREATED PLYWOOD

- A. General: 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. Plywood: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.
- C. Fire-Retardant-Treated 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 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.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Hoover Treated Wood Products, Inc.; Exterior Fire-X, or a comparable product.
- D. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- E. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- F. Application: Treat items indicated on Drawings, and the following:
 - 1. Plywood roof sheathing.

2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Provide all fasteners of Type 304 stainless steel.
- B. Wood Screws for Attachment of Roof Blocking: Screws complying with ASME B18.6.1. Series 300 stainless steel, non-magnetic, torx or square drive, #10, length as required to provide minimum embedment of 1-1/2-inches into substrate.
- C. Screws for Attachment to Metal Deck: Self drilling screws complying with ASME B18.6.1. Series 300 stainless steel, non-magnetic, torx or square drive, #10, 2-1/2-inch length (unless otherwise noted).
- D. Screws for Attachment to Steel Angles or Framing: Self drilling screws complying with ASME B18.6.1. Series 300 stainless steel, non-magnetic, #12, 2-1/2-inch length minimum (unless otherwise noted).
 - 1. With Winged Reamers: Wings designed to break off at contact with steel.
- E. Lag Bolts: ASME B18.2.1.
- 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. Anchor expands by tightening or hammering a pin after insertion into predrilled hole.

1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.4 MISCELLANEOUS MATERIALS

- A. Adhesives: Low odor, low VOC (less than 2 percent by weight), high-strength polyurethane formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Henkel Corporation; Loctite PL Premium Fast Grab, or a comparable product
- B. Isolation Barrier Membrane: 40-mil-thick, self-adhering sheet consisting of rubberized asphalt laminated to a cross-laminated polyethylene film with release liner on adhesive side.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Carlisle Coatings & Waterproofing; CCW-705, or comparable product.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- E. Where preservative-treated lumber is installed adjacent to metal decking, install continuous isolation barrier membrane between wood and metal decking.

3.2 WOOD BLOCKING, NAILER AND PLYWOOD INSTALLATION

- A. Install where indicated and where 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.
 - 1. Provide 1/4-inch vent space between each length of blocking.

- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with recommendations of FM Global Loss Prevention Data Sheet 1-49 and the following:
 - 1. Anchor bottom blocking to steel angles with minimum 3/8-inch stainless steel bolts with washers, at maximum 24 inches on center, or self-drilling screws in two rows, spaced not more than 24 inches on center and 6 inches from ends of blocking lengths.
 - 2. At locations where bottom blocking is to be attached directly to metal decking, provide isolation barrier membrane between deck and blocking, install wrinkle free. Apply primer if required by membrane manufacturer. Use primer rather than nails for installing membrane at low temperatures, overlap edges not less than 3-1/2 inches, roll laps with roller, cover membrane within 14 days. Attach bottom blocking with stainless steel self-drilling screws, penetrating metal decking at least 1 inch in two rows, spaced not more than 24 inches on center and 6 inches from ends of blocking lengths.
 - 3. Attach subsequent blocking to bottom blocking with stainless steel screws, penetrating at least 1-1/4 inches in two rows, spaced not more than 24 inches on center and 6 inches from ends of blocking lengths.
 - 4. Attach plywood to substrate with stainless steel screws spaced at 12" o.c. max. Where more than one layer of plywood is being attached, attach subsequent plywood to base layer of plywood/substrate with polyurethane construction adhesive beads spaced at 6" o.c. maximum and stainless-steel screws, penetrating at least ¾ inches in two rows, spaced not more than 12 inches on center and within 4 inches from end of panel lengths.
 - 5. At outside building corners, locate fasteners at 12 inches on center and 6 inches from corner, unless closer spacing is required to meet minimum 100 lb per fastener withdrawal force in any direction, or to comply with FM 1-49 recommendations.

END OF SECTION 06 10 26

SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wall and soffit sheathing.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
- B. As-Specified Data: If the product to be incorporated into Project is as specified by manufacturer name and product designation in Part 2 of this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for item listed below, otherwise submit full Product Data for the following.
 - 1. Glass-mat gypsum wall sheathing.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WALL AND SOFFIT SHEATHING

- A. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.
 - 1. <u>Products</u>: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. <u>CertainTeed Corporation; GlasRoc Sheathing Type X.</u>
 - b. Georgia-Pacific Gypsum LLC; DensGlass Fireguard Sheathing.
 - c. USG Corporation; USG Securock Brand Glass-Mat Sheathing Firecode X.
 - 2. Type and Thickness: Type X, 5/8 inch thick.

2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For soffit and wall sheathing, provide fasteners of Type 304 stainless steel.
- B. Nails, 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. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
 - 1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C 1002.
 - 2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C 954.

2.4 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
 - 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.
- B. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- C. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- D. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in the building Code in effect for the Project.
 - 2. ICC-ES evaluation report for fastener.
- E. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- F. Coordinate wall and soffit sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- G. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- H. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.

- D. Seal sheathing joints according to sheathing manufacturer's written instructions.
 - 1. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 06 16 00

SECTION 07 01 50.19 - PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof tear-off.

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Existing Membrane Roofing System: Built-up asphalt roofing membrane, roof insulation, surfacing, and components and accessories between deck and roofing membrane.
- C. Roof Tear-Off: Removal of existing membrane roofing system from deck.
- D. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.
- E. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.5 INFORMATIONAL SUBMITTALS

A. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

1.6 CLOSEOUT SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes, such as asbestoscontaining material, by a landfill facility licensed to accept hazardous wastes.
- B. Existing Roofing System Warranty Documentation: Documentation verifying that existing roofing system has been inspected and warranty remains in effect.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Installer of new membrane roofing system, licensed to perform asbestos abatement in the State or jurisdiction where Project is located.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning membrane roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Reroofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner; Architect; testing and inspecting agency representative; roofing system manufacturer's representative; deck Installer; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing system tear-off and replacement including, but not limited to, the following:
 - a. Reroofing preparation, including membrane roofing system manufacturer's written instructions.
 - b. Temporary protection requirements for existing roofing system that is to remain during and after installation.
 - c. Existing roof drains and roof drainage during each stage of reroofing, and roof drain plugging and plug removal requirements.
 - d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to make progress.
 - e. Existing deck removal procedures and Owner notifications.
 - f. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
 - g. Structural loading limitations of deck during reroofing.
 - h. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect reroofing.
 - i. HVAC shutdown and sealing of air intakes.
 - j. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
 - k. Asbestos removal and discovery of asbestos-containing materials.
 - l. Governing regulations and requirements for insurance and certificates if applicable.
 - m. Existing conditions that may require notification of Architect before proceeding.

1.8 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
 - 1. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated before proceeding with work over the impaired deck area.

- B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
 - 1. The results of an analysis of test cores from existing membrane roofing system are available for Contractor's reference.
- E. Handle and store materials and place equipment in a manner to avoid deflection of deck, overloading, and possible disturbance to the building structure.
- F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
- G. Hazardous Materials: Present in building to be reroofed. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.
 - 3. Coordinate with hazardous material remediation subcontractor to prevent water from entering existing roofing system or building.

PART 2 - PRODUCTS

2.1 AUXILIARY REROOFING MATERIALS

A. General: Auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new membrane roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect existing membrane roofing system that is indicated not to be reroofed.
 - 1. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
 - 2. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.

- B. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
 - 1. Test, verify and confirm existing roof drains are operational and document conditions at each roof drain in writing prior to beginning work.
- D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.
- E. Verify that rooftop utilities and service piping have been shut off before beginning the Work.
- F. Beginning reproofing preparation constitutes Contractor's acceptance of substrates and conditions.

3.2 ROOF TEAR-OFF

- A. General: Notify Owner each day of extent of roof tear-off proposed for that day.
- B. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing using a power broom.
- C. Remove pavers and accessories from roofing membrane.
- D. Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck.
 - 1. Remove cover boards, roof insulation and substrate boards.
 - 2. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry. Remove unadhered bitumen and felts and wet felts.
 - 3. Remove excess asphalt from steel deck. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.
 - 4. Remove fasteners from deck.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of membrane roofing system.

- B. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263 or by pouring 1 pint of hot roofing asphalt on deck at start of each day's work and at start of each roof area or plane. Do not proceed with roofing work if moisture condenses under the plastic sheet or if asphalt test sample foams or can be easily and cleanly stripped after cooling.
- C. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.
- D. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.
- E. Replace deck as indicated on Drawings. Replacement deck is specified in Section 05 31 00 Steel Decking

3.4 EXISTING BASE FLASHINGS

- A. Remove existing base flashings around parapets, curbs, walls, and penetrations.
 - 1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.
- B. Replace metal counterflashings with counterflashings as specified in Section 07 71 00 "Roof Specialties."
- C. Remove existing parapet sheathing and replace with new pressure-preservative-treated plywood sheathing, 3/4 inch thick. If parapet substrate has deteriorated, immediately notify Architect.

3.5 DISPOSAL

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
 - 1. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 07 01 50.19

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Extruded polystyrene foam-plastic board.
 - 2. Glass-fiber blanket.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Adhesive for bonding insulation.
- B. As-Specified Data: If the product to be incorporated into Project is as specified by manufacturer name and product designation in Part 2 of this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below, otherwise submit full Product Data for the following:
 - 1. Extruded polystyrene board, Type IV, 25-psi.
 - 2. Glass-fiber blanket, unfaced.
- C. Sustainable Design Submittals:
 - 1. Product Data: For adhesives, indicating VOC content.

1.5 QUALITY ASSURANCE

A. Identification: Identify product R-values with manufacturer's markings, or certification, in accordance with requirements of building Code in effect for the Project.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to 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.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

- A. Extruded Polystyrene Board, Type IV: ASTM C 578, Type IV, 25-psi minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - a. Dow Chemical Company (The); Styrofoam Brand Extruded Polystyrene Foam (XPS) Cavitymate Plus Insulation.
 - b. Owens Corning; Foamular CW25 Extruded Polystyrene (XPS) Insulation (Square Edge).
 - 2. Thermal Resistance: R-value of 5.0 per inch.
 - 3. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS-FIBER BLANKET

- A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - a. CertainTeed Corporation; Sustainable Insulation Fiber Glass Building Insulation Unfaced.
 - b. Owens Corning: ProPink EcoTouch Unfaced Fiberglas Insulation.

2.3 ACCESSORIES

- A. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
 - 1. Adhesives shall have a VOC content of [70] < Insert value > g/L or less.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for conditions affecting performance of the Work.
- B. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation, or that interfere with insulation attachment.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.
- E. Install insulation so that manufacturer's R-value mark is readily observable, in accordance with requirements of building Code in effect for the Project.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

- A. 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 extruded polystyrene board (Type IV, 25-psi) insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.
 - 1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Division 04 Section "Unit Masonry."

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

3.5 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 07 21 00

SECTION 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Vapor-retarding, fluid-applied air barriers.

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.
 - 1. Accessory materials.
 - 2. Primers.
 - 3. Stainless-steel sheet.
- B. As-Specified Data: If the product to be incorporated into Project is as specified by manufacturer name and product designation in Part 2 of this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below, otherwise submit full Product Data for the following:
 - 1. High-build, vapor-retarding air barrier.

C. Sustainable Design Submittals:

1. Product Data: For coatings, indicating VOC content.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates, Compatibility: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
- C. Product Certificates, Fire Propagation Characteristics: From a qualified testing agency, documenting that air barrier system as a component of the indicated wall assembly has been tested and passed NFPA 285.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.
- B. VOC Content: 100 g/L or less.

2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous 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[, tie-ins to installed waterproofing], and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E2357.

2.3 HIGH-BUILD AIR BARRIERS, VAPOR RETARDING

- A. High-Build, Vapor-Retarding Air Barrier: Synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 40 mils or thicker over smooth, void-free substrates.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - a. Carlisle Coatings & Waterproofing, Incorporated; Fire Resist Barritech NP.
 - b. Henry Company; Air-Bloc 32MR.
 - c. Meadows, W. R., Inc.; Air-Shield LSR.
 - d. Tremco, Inc., Commercial Sealants and Waterproofing Division, an RPM company; ExoAir 130.

2. Physical and Performance Properties:

- a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E2178.
- b. Vapor Permeance: Maximum 0.1 perm; ASTM E96/E96M, Desiccant Method.
- c. Ultimate Elongation: Minimum300 percent; ASTM D412, Die C.
- d. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D4541.
- e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- f. UV Resistance: Can be exposed to sunlight for 90 days according to manufacturer's written instructions.

2.4 ACCESSORY MATERIALS

A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Stainless-Steel Sheet: ASTM A240/A240M, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 - 2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
 - 3. Verify that substrates are visibly dry and free of moisture.
 - 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. 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 material.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. 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.
- G. 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.

H. Bridge isolation joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water 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 transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
 - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Connect and seal exterior wall air-barrier material 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.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. 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.
- E. 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 each substrate. 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.
- F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- H. Seal top of through-wall flashings to air barrier with an additional 6-inch-wide, transition strip.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

J. 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.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
- B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.
 - 1. Vapor-Retarding, High-Build Air Barrier: Total dry film thickness not less than 40 mils.
- C. Do not cover air barrier until it has been tested and inspected by testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
- B. Inspections: Air-barrier materials, accessories, 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. Air-barrier dry film thickness.
 - 3. Continuous structural support of air-barrier system has been provided.
 - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 5. Site conditions for application temperature and dryness of substrates have been maintained.
 - 6. Maximum exposure time of materials to UV deterioration has not been exceeded.

- 7. Surfaces have been primed, if applicable.
- 8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
- 9. Termination mastic has been applied on cut edges.
- 10. Strips and transition strips have been firmly adhered to substrate.
- 11. Compatible materials have been used.
- 12. Transitions at changes in direction and structural support at gaps have been provided.
- 13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
- 14. All penetrations have been sealed.
- C. Tests: As determined by testing agency from among the following tests:
 - 1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E1186, chamber pressurization or depressurization with smoke tracers or ASTM E1186, chamber depressurization using detection liquids.
 - 2. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to ASTM E783.
 - 3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D4541 for each 600 sq. ft. of installed air barrier or part thereof.
- D. Air barriers will be considered defective if they do not pass tests and inspections.
 - 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
 - 2. Remove and replace deficient air-barrier components for retesting as specified above.
- E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- F. Prepare test and inspection reports.

3.6 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 recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
- 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 07 27 26

SECTION 07 53 23 - EPDM ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Adhered ethylene-propylene-diene-terpolymer (EPDM) roofing system.
- 2. Substrate boards.
- 3. Roof insulation.
- 4. Cover board.
- 5. Walkways.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Construction Manager, testing and inspecting agency representative, roofing Installer, roofing Installer's superintendent, roofing system manufacturer's technical representative, deck (infill) Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing 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.
 - 4. Examine deck substrate conditions and finishes, including flatness and fastening.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.

- 7. Review temporary protection requirements for roofing system during and after installation.
- 8. Review building occupancy, safety, HVAC and equipment shut-downs, noise levels and other items that will affect the building occupants and those on or near the site.
- 9. Review roof observation and repair procedures after roofing installation.

1.5 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals (except field quality-control reports) required by this Section concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. EPDM sheet.
 - 2. Sheet flashing.
 - 3. Bonding adhesive.
 - 4. Adhesive/primer.
 - 5. Membrane cleaner.
 - 6. Seaming material.
 - 7. Lap sealant.
 - 8. Water cutoff mastic.
 - 9. Liquid flashing system.
 - 10. Metal termination bars.
 - 11. Fasteners.
 - 12. Miscellaneous accessories.
 - 13. Polyisocyanurate board insulation.
 - 14. Tapered insulation.
 - 15. Insulation fasteners.
 - 16. Insulation adhesive.
 - 17. Flexible walkways.
 - 18. Substrate boards.
 - 19. Cover board.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 - 1. Layout, R-values and thickness of insulation.
 - 2. Base flashings and membrane terminations.
 - 3. Flashing details at penetrations.
 - 4. Tapered insulation, thickness, R-values and slopes.
 - 5. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples: For the following products:
 - 1. Roof membrane and flashings.

- 2. Substrate board.
- Roof insulation.
- 4. Cover board.
- 5. Walkway pads.
- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.
- E. Sample Warranties: For manufacturer's special warranties and special Project warranties.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates:
 - 1. Performance Requirement Certificate: Signed by roof membrane manufacturer, identifying all roof system components and certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of complying with performance requirements.
 - 2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
- C. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Warranty: Executed special warranties and special Project warranties.
- C. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer for roofing system identical to that used for this Project.
 - 1. Manufacturer's Technical Representative: A non-sales technical representative who shall, at a minimum:
 - a. Participate in the Preinstallation Roofing Conference.
 - b. Witness start of roofing membrane installation.
 - c. Inspect the roofing membrane installation when work is approximately 50 percent complete to ascertain that procedures being followed are proper and to determine whether any corrective work will be required.

- d. Inspect the roofing membrane installation at completion to determine whether any corrective work will be required prior to issuing the warranty. Notify the Owner and Architect a minimum of 72 hours before said inspection.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty, and has successfully completed a minimum of three similar-sized projects in the last five years.
 - 1. Installer's Superintendent Qualifications: An experienced superintendent who is trained and approved by roofing system manufacturer, to oversee installation on-site of roofing system at all times roofing work is in progress.
 - 2. Provide adequate number of experienced workers regularly engaged in this type of work who are skilled in the application techniques of the materials specified.
- C. Identification: Identify product R-values with manufacturer's markings, or certification, in accordance with requirements of building Code in effect for the Project.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
 - 1. Do not install materials that are wet or moisture damaged; remove from Project site.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.11 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Proceed with work such that recently completed roof areas are not subjected to construction traffic. Protect recently completed roof areas and inspect for possible damage.

1.12 COORDINATION

A. Coordinate construction operations on or adjacent to roof, included in different Sections, which depend on each other for proper installation, connection, and operation.

1.13 WARRANTY

- A. Special Warranty: Manufacturer's total system "edge-to-edge" warranty, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Pro-rated warranties are not acceptable.
 - 1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, cover boards and other components of roofing system.
 - 2. Special warranty includes roof specialties specified in Division 07 Section "Roof Specialties."
 - 3. Special warranty includes coverage for wind damage sustained up to wind speeds specified in "Performance Requirements" Article and/or as indicated on Drawings.
 - 4. Special warranty includes coverage for hail resistance.
 - 5. Warranty Period: 20 years (Base Bid), 30 years (Alternate) from Date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, covering the Work of this Section, including all components of roofing system such as roof membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, and walkway products, against leaks and faulty or defective materials and workmanship, and to repair or replace work, without monetary limitation, for the following warranty period:
 - 1. Warranty Period: 2 years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and flashings shall remain watertight.
 - 1. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746, ASTM D4272, or the Resistance to Foot Traffic Test in FM Approvals 4470.

- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures calculated according to the requirements of the Building Code of New York State, which references ASCE/SEI 7:
 - 1. Wind Speed: As indicated on Drawings.
 - a. Ultimate design wind speed (3-second gust) as indicated on Drawings.
 - b. Nominal design wind speed (3-second gust) as indicated on Drawings.
 - 2. Wind Uplift Pressures: As indicated on Drawings.
 - 3. Other Loads: As indicated on Drawings.
 - 4. Fire/Windstorm Classification: Class 1A-90.
 - 5. Hail-Resistance Rating: FM Global Property Loss Prevention Data Sheet 1-34 MH.
- D. SPRI's Directory of Roof Assemblies Listing: Roof membrane, base flashings, and component materials shall comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and shall be listed in SPRI's Directory of Roof Assemblies for roof assembly identical for that specified for this Project.
 - 1. Wind Uplift Load Capacity: 120 psf.
- E. EPDM Sheet: (Typical for all areas unless noted otherwise) ASTM D4637/D4637M, Type I, nonreinforced, fire-retardant EPDM sheet.
 - 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. Carlisle SynTec Incorporated.
 - b. Firestone Building Products.
 - c. Johns Manville; a Berkshire Hathaway company.
 - 2. Thickness: 60-mil (Base Bid), 90-mil (Alternate) nominal.
 - 3. Sheet Width: Maximum allowable for applicable installation.
 - 4. Exposed Face Color: Black.
- F. EPDM Sheet with felt backing: (For use at chiller tank platform only) ASTM D4637-96, Type III (Fabric-backed membrane) 145 (.090) felt backed EPDM membrane sheet.

- 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. Carlisle SynTec Incorporated.
- 2. Sure Seal, FleeceBACK.
- 3. Thickness: .145 (.090")
- 4. Adhered to primed substrate with Carlisle Flexible FAST adhesive, beads spaced at 4" o.c. max.
- 5. Sheet Width: Maximum allowable for applicable installation.
- 6. Exposed Face Color: Black.

2.2 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
 - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
 - 2. Adhesives and sealants on the interior side of weather barrier shall comply with the following limits for VOC content:
 - a. Plastic Foam Adhesives: 50 g/L.
 - b. Panel Adhesives: 50 g/L.
 - c. Multipurpose Construction Adhesives: 70 g/L.
 - d. Fiberglass Adhesives: 80 g/L.
 - e. Other Adhesives: 250 g/L.
 - f. Single-Ply Roof Membrane Sealants: 450 g/L.
 - g. Nonmembrane Roof Sealants: 300 g/L.
 - h. Sealant Primers for Nonporous Substrates: 250 g/L.
 - i. Sealant Primers for Porous Substrates: 775 g/L.
- B. Sheet Flashing: 60-mil-thick EPDM, partially cured or cured, according to application.
- C. Bonding Adhesive: Manufacturer's standard, low-VOC type.
- D. Adhesive/Primer: Manufacturer's standard, low-VOC type.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Carlisle SynTec Incorporated; Cav-Grip III Low-VOC Adhesive/Primer, or comparable product.
- E. Membrane Cleaner: Manufacturer's standard.

- F. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 6-inch-wide minimum, butyl splice tape with release film.
 - 1. At Contractor's option, seam tape may be factory-applied type (FAT).
- G. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.
- H. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- I. Liquid Flashing System: Manufacturer's standard, low-VOC type, cold-applied flashing system, including polyurethane-based resin, fabric flashing, primer, and related materials.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Carlisle SynTec Incorporated; Liquiseal Liquid Flashing, or comparable product.
- J. Metal Termination Bars: Manufacturer's standard, predrilled at 6-inch centers aluminum bars, approximately 1 by 1/8 inch thick; with sealant ledge.
 - 1. Fasteners: Series 300 stainless steel drive pin fasteners for masonry substrate embedment, Series 300 stainless steel screw-type fasteners at wood substrate embedment.
- K. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to roofing system manufacturer.
 - 1. Fasteners at Wood-Preservative-Treated Lumber: Screws complying with ASME B18.6.1. Series 300 stainless steel, non-magnetic, torx or square drive, #10, length as required to provide minimum embedment of 1-1/2-inches into substrate.
- L. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

2.3 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C1278/C1278M, fiber-reinforced gypsum board.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide United States Gypsum Company; USG Securock Brand Gypsum-Fiber Roof Board, or comparable product.
 - 2. Thickness: 1/2 inch.
 - 3. Size: 48 by 96 inches.
 - 4. Surface Finish: Factory primed.

B. Fasteners: Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate panel to roof deck.

2.4 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by EPDM roof membrane manufacturer, and in compliance with "Performance Requirements" Article..
 - 1. Minimum Total System R-Value: 30.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 2, Grade 2, glass-fiber mat facer on both major surfaces.
 - 1. Compressive Strength: 20 psi.
 - 2. Size: 48 by 48 inches, for adhered installation and 48 by 96 inches, for mechanical attached installation.
 - 3. Thickness:
 - a. Base Layer: Not less than 2.4 inches.
 - b. Upper Layer: Not less than 2.4 inches.
- C. Tapered Insulation: Provide factory-tapered insulation boards.
 - 1. Material: Match roof insulation.
 - 2. Minimum Thickness: 1/8 inch.
 - 3. Slope:
 - a. Roof Field: 1/8 inch per foot unless otherwise indicated on Drawings.
 - b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

2.5 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.

- D. Cover Board: ASTM C1289 Type II, Class 4, Grade 1, 1/2-inch-thick polyisocyanurate, with a minimum compressive strength of 80 psi.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle SynTec Incorporated; SecurShield HD Polyiso.
 - b. Firestone Building Products; Isogard HD Cover Board.
 - c. Johns Manville; a Berkshire Hathaway company; ProtectoR HD.

2.6 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, not less than 0.30 inch thick and acceptable to roofing system manufacturer.
 - 1. Size: Approximately 30 by 30 inches.

2.7 ROOF INFORMATION DECALS

- A. Roofing manufacturer's roof information decal including the following information clearly printed in permanent ink:
 - 1. Name of roofing manufacturer.
 - 2. Name of roofing installer.
 - 3. Type of roofing system including membrane type and thickness.
 - 4. Date of substantial completion.
 - 5. Manufacturer's project identification number.
 - 6. Roofing system warranty duration.
 - 7. Telephone number for reporting warranty-related questions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that steel roof deck is solid and securely attached.

- 4. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer when tested according to ASTM F2170.
 - a. Test Frequency: One test probe per each 1000 sq. ft., or portion thereof, of roof deck, with not less than three test probes.
 - b. Submit test reports within 24 hours of performing tests.
- 5. Verify any damaged sections of cementitious wood-fiber decks have been repaired or replaced.
- 6. Verify adjacent cementitious wood-fiber panels are vertically aligned to within 1/8 inch at top surface.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Perform fastener-pullout tests according to roof system manufacturer's written instructions.
 - 1. Submit test result within 24 hours of performing tests.
 - a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.

3.3 INSTALLATION OF ROOFING, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions, in compliance with "Performance Requirements" Article assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Install roof membrane and auxiliary materials to tie into existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.

3.4 INSTALLATION OF SUBSTRATE BOARD

- A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
 - 1. Tightly butt substrate boards together.
 - 2. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 3. Mechanically Attached Substrate Boards: Fasten substrate board to wood deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturers' written instructions and in compliance with "Performance Requirements" Article; minimum quantity: one fastener per 2 square feet at field and perimeter, one fastener per square foot at corners.

3.5 INSTALLATION OF INSULATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Insulation Installation, General:
 - 1. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 2. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - 3. Fill gaps exceeding 1/4 inch with insulation.
 - 4. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - 5. Keep manufacturer's R-value markings readily observable in accordance with building Code in effect for Project.
 - 6. Construct tapered sumps at roof drain locations as shown on Drawings.
 - 7. Trim insulation so that water flow is unrestricted.

D. Installation Directly Over Metal Decking:

- 1. Mechanically Attached Base Layer: Install base layer of insulation with end joints staggered not less than 12 inches in adjacent rows and with long joints continuous at right angle to flutes of decking.
 - a. Locate end joints over crests of decking.
 - b. Mechanically attach base layer of insulation using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.
 - 1) Fasten insulation to resist specified uplift pressure in compliance with "Performance Requirements" Article; minimum quantity: one fastener per 2 square feet at field and perimeter, one fastener per square foot at corners.

- 2. Adhered Upper Layers: Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
 - a. Stagger end joints within each layer not less than 24 inches in adjacent rows.
 - b. Adhere each layer of insulation to substrate using adhesive in compliance with "Performance Requirements" Article and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set each layer of insulation in ribbons of bead-applied insulation adhesive, applied at a maximum of 4-inches on center at all field, perimeter and corner roof areas, firmly pressing and maintaining insulation in place.
 - 2) When installing the adhesive, do not allow the adhesive installation pattern to exceed the width of the board being installed. Exceeding the width of the roof board will cause an uneven application of the adjacent board due to the rising adhesive. Remove any excess adhesive from adjacent surfaces immediately prior to rising and curing.
 - 3) Walk the boards into the adhesive and roll with a 30-inch wide, 150 pound weighted steel roller to ensure full embedment.

E. Installation Over Substrate Board:

- 1. Adhered Base Layer: Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.
 - a. Adhere base layer of insulation to substrate in compliance with "Performance Requirements" Article and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set base layer of insulation in ribbons of bead-applied insulation adhesive, applied at a maximum of 4-inches on center at all field, perimeter and corner roof areas, firmly pressing and maintaining insulation in place.
 - 2) When installing the adhesive, do not allow the adhesive installation pattern to exceed the width of the board being installed. Exceeding the width of the roof board will cause an uneven application of the adjacent board due to the rising adhesive. Remove any excess adhesive from adjacent surfaces immediately prior to rising and curing.
 - 3) Walk the boards into the adhesive and roll with a 30-inch wide, 150 pound weighted steel roller to ensure full embedment.
- 2. Adhered Upper Layers: Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
 - a. Stagger end joints within each layer not less than 24 inches in adjacent rows.

- b. Adhere each layer of insulation to substrate using adhesive in compliance with "Performance Requirements" Article and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set each layer of insulation in ribbons of bead-applied insulation adhesive, applied at a maximum of 4-inches on center at all field, perimeter and corner roof areas, firmly pressing and maintaining insulation in place.
 - 2) When installing the adhesive, do not allow the adhesive installation pattern to exceed the width of the board being installed. Exceeding the width of the roof board will cause an uneven application of the adjacent board due to the rising adhesive. Remove any excess adhesive from adjacent surfaces immediately prior to rising and curing.
 - 3) Walk the boards into the adhesive and roll with a 30-inch wide, 150 pound weighted steel roller to ensure full embedment.
- F. Installation Over Concrete, Cementitious Wood-Fiber ("Tectum") or Gypsum Decks:
 - 1. Adhered Base Layer: Thoroughly clean and prime deck surface, install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.
 - a. Adhere base layer of insulation to concrete roof deck, cementitious wood-fiber roof deck, or Gypsum roof deck in compliance with "Performance Requirements" Article and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set insulation in ribbons of bead-applied insulation adhesive, applied at a maximum of 4-inches on center at all field, perimeter and corner roof areas, firmly pressing and maintaining insulation in place.
 - 2) When installing the adhesive, do not allow the adhesive installation pattern to exceed the width of the board being installed. Exceeding the width of the roof board will cause an uneven application of the adjacent board due to the rising adhesive. Remove any excess adhesive from adjacent surfaces immediately prior to rising and curing.
 - 3) Walk the boards into the adhesive and roll with a 30-inch wide, 150 pound weighted steel roller to ensure full embedment.
 - 2. Adhered Upper Layers: Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
 - a. Stagger end joints within each layer not less than 24 inches in adjacent rows.
 - b. Adhere each layer of insulation to substrate using adhesive in compliance with "Performance Requirements" Article and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set each layer of insulation in ribbons of bead-applied insulation adhesive, applied at a maximum of 4-inches on center at all field, perimeter and corner roof areas, firmly pressing and maintaining insulation in place.

- 2) When installing the adhesive, do not allow the adhesive installation pattern to exceed the width of the board being installed. Exceeding the width of the roof board will cause an uneven application of the adjacent board due to the rising adhesive. Remove any excess adhesive from adjacent surfaces immediately prior to rising and curing.
- 3) Walk the boards into the adhesive and roll with a 30-inch wide, 150 pound weighted steel roller to ensure full embedment.

3.6 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
 - 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 2. Cut and fit cover board tight to nailers, projections, and penetrations.
 - 3. Adhere cover board to substrate using adhesive in compliance with "Performance Requirements" Article and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - a. Set cover board in ribbons of bead-applied insulation adhesive, applied at a maximum of 4-inches on center at all field, perimeter and corner roof areas firmly pressing and maintaining insulation in place.
 - b. When installing the adhesive, do not allow the adhesive installation pattern to exceed the width of the board being installed. Exceeding the width of the roof board will cause an uneven application of the adjacent board due to the rising adhesive. Remove any excess adhesive from adjacent surfaces immediately prior to rising and curing.
 - c. Walk the boards into the adhesive and roll with a 30-inch wide, 150 pound weighted steel roller to ensure full embedment.

3.7 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Thoroughly clean substrate of all debris, projections, and substances detrimental to membrane installation including stray projections of insulation adhesive.
- B. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- C. Unroll membrane roof membrane and allow to relax before installing.
- D. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

- E. Accurately align roof membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- F. Bonding Adhesive: Apply 100 percent coverage to substrate and underside of roof membrane at rate required by manufacturer and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
 - 1. Bonding Adhesive at fabric backed membrane: Adhere to primed substrate with Carlisle Flexible FAST adhesive, beads spaced at 4" o.c. max.
- G. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeters.
- H. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- I. Apply pressure to the membrane surface in accordance with manufacturer's instructions to obtain maximum contact between the membrane and substrate.
- J. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape.
 - 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
 - 2. Apply lap sealant and seal exposed edges of roofing terminations.
 - 3. At Contractor's option, use manufacturer's factory-applied seam tape installation system.
- K. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- L. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.8 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.9 INSTALLATION OF WALKWAYS

- A. Flexible Walkways: Install walkway products according to manufacturer's written instructions.
 - 1. Install flexible walkways at the following locations:
 - a. Perimeter of each rooftop unit.
 - b. Top and bottom of each roof access ladder.
 - c. Locations indicated on Drawings.
 - d. As required by roof membrane manufacturer's warranty requirements.
 - 2. Adhere walkway products to substrate according to roofing system manufacturer's written instructions.

3.10 ROOF INFORMATION DECAL(S) INSTALLATION

A. Adhesively attach roofing manufacturer's Roof Information Decal at all roof access points (i.e. inside face of hatches, doors, etc. leading to the roof).

3.11 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
- B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.12 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Thoroughly clean all roof and ground work areas of dust, debris, excess materials and equipment.
- D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 53 23

SECTION 07 71 00 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Copings.
 - 2. Roof-edge specialties.
 - 3. Roof-edge drainage systems.
 - 4. Counterflashings.
 - 5. Wall panel system.

1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. FM Approvals' Listing: Manufacture and install roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with FM Approvals' markings.
- C. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested according to SPRI ES-1 as well as successfully tested by a qualified testing and inspecting agency to resist uplift pressures provided below calculated according to the requirements of the Building Code of New York State, which references ASCE/SEI 7.
- A. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures calculated according to the requirements of the Building Code of New York State, which references ASCE/SEI 7:
 - 1. Wind Speed:
 - a. Ultimate design wind speed (3-second gust) as indicated on Drawings.
 - b. Nominal design wind speed (3-second gust) as indicated on Drawings.
 - 2. Wind Loads: As indicated on Drawings.
 - 3. Other Loads: As indicated on Drawings.

- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent 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 thermal movements. Base calculations 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.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 1. Aluminum sheet.
 - 2. Zinc-coated (galvanized) steel sheet.
 - 3. Fasteners.
 - 4. Copings.
 - 5. Canted roof-edge fascia.
 - 6. Drip-edge fascia.
 - 7. Fascia sump and spillout scupper.
 - 8. Gutters.
 - 9. Downspouts.
 - 10. Counterflashings.
 - 11. Wall panel system.
- B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work. Include the following:
 - 1. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
 - 2. Profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 - 3. Details of termination points and assemblies, including fixed points.
 - 4. Details of special conditions.
- C. Samples for Initial Selection: For sealant and each type of roof specialty indicated with factory-applied color finishes.
- D. Samples for Verification: For roof-edge flashings, copings, roof-edge drainage systems, counterflashings made from 12-inch lengths of full-size components including fasteners, cover joints, accessories, and attachments.

1.6 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing specialties to include in maintenance manuals.
- B. Warranty: Executed special warranty.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- 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. Furnish not less than ten 12-foot-long sections of canted roof-edge fascia, coping and extender covers.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approved and listed for specified class and SPRI ES-1 tested to specified design pressure.
- B. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty.
- C. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Installer, and installers whose work interfaces with or affects roof specialties including installers of roofing materials and accessories.
 - 2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.10 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof specialties installation.

1.12 WARRANTY

- A. Special Warranty: Warranty, as part of special warranty in Division 07 Section "EPDM Roofing", in which Installer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.
- B. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EXPOSED METALS

- A. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
 - 1. Surface: Smooth, flat finish.
 - 2. Exposed Coil-Coated Finishes: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer: AAMA 2605. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight in color coat.

2.2 CONCEALED METALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.

2.3 COPINGS

- A. Copings: Manufactured coping system consisting of formed-metal coping cap in longest uniform section lengths practical, not exceeding 12 feet, concealed anchorage; corner units, end cap units, and concealed splice plates with same finish as coping caps.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle SynTec Incorporated; SecurEdge Coping System.
 - b. Firestone Building Products; Firestone Coping.
 - c. Johns Manville; Presto Lock Coping System.
 - 2. Coping-Cap Material: Formed aluminum, not less than 0.063 inch thick and as required to meet performance requirements. Custom profile may be required.
 - a. Finish: Two-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
 - 3. Corners: Factory mitered and continuously welded, not less than 2 feet long in each direction.
 - 4. Coping-Cap Attachment Method: Snap-on, fabricated from coping-cap material.
 - a. Snap-on-Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.

2.4 ROOF-EDGE SPECIALTIES

- A. Canted Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of compression-clamped metal fascia cover in longest uniform section lengths practical, not exceeding 12 feet and a continuous formed galvanized-steel sheet cant, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle SynTec Incorporated; SecurEdge System 300.
 - b. Firestone Building Products; EdgeGard +.
 - c. Johns Manville; Fascia System 200.
 - 2. Fascia Cover: Fabricated from the following exposed metal:
 - a. Formed Aluminum: Not less than 0.050 inch thick and as required to meet performance requirements.
 - 3. Corners: Factory mitered and continuously welded, not less than 2 feet long in each direction.
 - 4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.

5. Fascia Extenders:

- a. Fabricated from formed aluminum not less than 0.050 inch thick and as required to meet performance requirements, with pre-punched slotted holes at 12 inches o.c. at top edge in longest uniform section lengths practical and not exceeding 12 feet.
- b. Factory mitered and continuously welded corners, not less than 2 feet long in each direction.
- c. Concealed splice plates, of same material, finish, and shape as extender.
- d. Continuous formed galvanized-sheet steel hold-down cleats, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.

6. Fascia Accessories:

- a. Soffit trim.
- b. Fascia sump integrated into fascia system (listed in Roof Edge Drainage paragraph below).
- c. Spillout scupper integrated into fascia system (listed in Roof Edge Drainage paragraph below).
- B. Provide the following roof edge fascia systems, when required by roof system manufacturer, to meet specified wind speed and/or warranty requirements: Manufactured, three-piece, roof-edge fascia in longest uniform section lengths practical, not exceeding lengths of 12 feet, consisting of formed .050" aluminum compression-clamped metal fascia cover, a continuous extruded aluminum anchor bar with extended vertical leg terminating in a drip-edge cleat and 24 gauge galvanized steel waterdam/cant. Provide matching corner units.
 - 1. Carlisle: "SecurEdge 2000 Canted Fascia Galvanized Waterdam Version":
 - 2. Firestone: "AnchorGard Canted Fascia Galvanized Waterdam Version":
 - 3. Johns Manville: "Presto-Tite Canted Fascia Galvanized Waterdam Version":
- C. Aluminum Finish: Two-coat fluoropolymer.
 - 1. Color: As selected by Architect from manufacturer's full range.
 - a. More than one color may be selected.
- D. Drip-Edge Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of formed compression-clamped metal fascia cover in section lengths not exceeding 12 feet and a continuous formed galvanized-steel sheet base, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle Syntec Incorporated; "SecurSeal Drip Edge".
 - b. Firestone Building Products; "Firestone Drip Edge".
 - c. Johns Manville; "Johns Manville Drip Edge".

- 2. Fascia Cover: Fabricated from the following exposed metal:
 - a. Formed Aluminum: Not less than 0.050 inch thick and as required to meet performance requirements.
- 3. Corners: Factory mitered and continuously welded, not less than 2 feet long in each direction.
- 4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
- 5. Fascia Extenders:
 - a. Fabricated from formed aluminum not less than 0.050 inch thick and as required to meet performance requirements, with pre-punched slotted holes at 12 inches o.c. at top edge.
 - b. Factory mitered and continuously welded corners, not less than 2 feet long in each direction.
 - c. Concealed splice plates, of same material, finish, and shape as extender.
 - d. Continuous formed galvanized-sheet steel hold-down cleats, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.
- 6. Fascia Accessories: Soffit closure trim.

2.5 ROOF-EDGE DRAINAGE SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - 1. Gutters:
 - a. To be provided by fascia system manufacturer, finish to match fascia system.
 - 2. Downspouts:
 - a. To be provided by fascia system manufacturer, finish to match fascia system.
 - 3. Fascia Sumps:
 - a. To be provided by fascia system manufacture, finish to match fascia system.
 - 4. Fascia Spillout Scuppers:
 - a. To be provided by fascia system manufacturer, finish to match fascia system.
 - 5. Conductor Heads:
 - a. To be provided by fascia manufacturer, finish to match fascia system.

- B. Gutters: Plain square/rectangular complete with mitered corners, end caps and outlet tubes, manufactured from exposed metal finished to match fascias, thickness as indicated below. Furnish with metal brackets mounted at rear of gutter from same material as downspouts. Provide stainless steel anchors.
 - 1. Formed Aluminum: 0.063 inch thick.
 - 2. Dimensions: Dimensions as indicated on drawings, minimum 6" x 6", elevate back edge at least 1" above formed front edge, in longest uniform lengths practical.
- C. Downspouts: Plain square/rectangular complete with mitered elbows, manufactured from exposed metal finished to match fascias, thickness as indicated below. Furnish with metal brackets mounted at rear of downspout from same material as downspouts. Provide stainless steel anchors.
 - 1. Formed Aluminum: 0.063 inch thick.
 - 2. Dimensions: Dimensions as indicated on drawings, minimum 4" x 4", in longest uniform lengths practical.
- D. Fascia Sumps: Manufactured, two-piece, roof-edge fascia sump consisting of continuous formed compression-clamped metal fascia cover to match fascias and a continuous formed galvanized-steel sheet, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat integrated into fascia system, complete with outlet tube that nests into upper end of downspout. Corners to be factory mitered and continuously welded.
 - 1. Fabricate from formed aluminum: 0.050 inch thick, profile to match fascia.
 - 2. Dimensions as indicated on Drawings.
- E. Spillout Scuppers: Manufactured fascia spillout scuppers, each with flanged sides and bottom, integrated into and finished to match fascia system. Corners to be factory mitered and continuously welded.
 - 1. Fabricate from formed aluminum: 0.050 inch thick, profile to match fascia.
 - 2. Dimensions as indicated on Drawings.
- F. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout.
 - 1. Formed Aluminum: 0.063 inch thick.
 - 2. Dimensions as indicated on Drawings or as required, verify in field.

2.6 COUNTERFLASHINGS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - 1. Metal-Era; "1-Piece Metal Counter Flashing, Surface or Reglet Version" as shown on drawings.
 - 2. W.P Hickman; (OMG) "1-Piece Flashing Surface or In-Wall Drive-Lock Reglet" as shown on drawings.

- 3. Metal-Era; "2-Piece Metal Counter Flashing, Reglet Version" as shown on drawings.
- 4. W.P Hickman; (OMG) "2-Piece Flashing In-Wall Drive-Lock Reglet" as shown on drawings.
- B. Formed Aluminum: Not less than 0.050 inch thick and as required to meet performance requirements.
- C. Corners: Factory mitered and continuously welded.
- D. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in longest uniform lengths practical, not exceeding 12 feet, designed to snap into masonry mortar joint and compress against base flashings with joints lapped, from the following exposed metal:
 - 1. Formed Aluminum: Not less than 0.050 inch thick and as required to meet performance requirements.
- E. Aluminum Finish: Two-coat fluoropolymer.
 - 1. Color: As selected by Architect from manufacturer's full range.

2.7 WALL PANEL SYSTEM

- A. Formed metal structural wall panel system with concealed fasteners and trim.
- B. Aluminum: 0.050 inch thick with acrylic coating.
- C. Panel Width: 12-inches.
- D. Panel Length: Cut to customer specifications with no end laps.
- E. Panel Depth: 1 1/8".
- F. Texture: Smooth. (solid).
- G. Finish: Kynar 500 PVDF. Color as selected by Architect from manufacturer's full range.
- H. Accessories: Concealed fasteners, trims to match material and thickness.
- I. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - 1. Atas International, Inc.; "Design Wall Panel System DWF".

2.8 GENERAL FINISH REQUIREMENTS

- 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: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Fasteners: Manufacturer's recommended fasteners, of Series 300 stainless steel, suitable for application and designed to meet performance requirements.
 - 1. Exposed Fasteners: Not permitted.
- C. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- D. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
- E. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- F. Elastomeric Sealant: Refer to Division 07 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of sealant.
 - 3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by applying adhered roofing membrane or self-adhering isolation barrier membrane or by other permanent separation as recommended by manufacturer.
 - 1. Underlayment: Where installing metal directly on cementitious or wood substrates, install a course of self-adhering, high-temperature sheet underlayment.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 feet with no joints within 24 inches of corners or intersections unless otherwise shown on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher or lower ambient temperatures.
 - 3. Loose-nail fascia extender at center of pre-punched slotted hole; do not draw nail tight.
 - 4. Stagger joints in fascia from those in fascia extender by not less than 2 feet.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints with elastomeric sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.3 ROOF-EDGE SPECIALTIES INSTALLATION

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
- C. Strip-in cleat over cant-dam as indicated on Drawings.

3.4 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
- B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 30-inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
 - 1. Provide expansion joints and cover caps at 48 feet maximum on center.
- C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.
 - 1. Provide elbows at base of downspout to direct water away from building.
 - 2. Provide adhered walk pad on roof directly below downspout outlet. Provide precast concrete splash block at grade directly below downspout outlet.
- D. Fascia sumps and spillout scuppers: Anchor securely to substrate to align with fascia with elevation of bottom drainage surface at 1 inch below roof surface.

3.5 COPING INSTALLATION

- A. Install fully adhered base roof membrane continuously over parapet roof edge and vertically to bottom of sub-fascia overlapping masonry or flush metal panel system as shown on details.
- B. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
- C. Anchor copings to meet performance requirements.
 - 1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.

3.6 COUNTERFLASHING INSTALLATION

- A. General: Coordinate installation of counterflashings with installation of base flashings and termination bars.
- B. Counterflashings: After completion of roofing work, install one-piece metal counter flashing by surface attaching or inserting metal reglet into horizontal saw-cut mortar joint. Provide continuous elastomeric sealant. Lap counter flashing joints a minimum of 4 inches. Install at height so that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant. Fit counterflashings tightly to base flashings. Do not saw-cut joint where through-wall flashing exists.

3.7 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 - 3. Install screw fasteners in predrilled holes.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Install flashing and trim as metal panel work proceeds.
 - 6. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 - 7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

- 1. Steel Panels: Use stainless-steel concealed fasteners.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal wall panel manufacturer.
 - 1. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean off excess sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

D.	Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.
	END OF SECTION 07 71 00

SECTION 07 72 00 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Equipment supports.
- 2. Vent pipe extensions.
- 3. Aluminum ladders and anchors.
- 4. Isolation barrier membrane.
- 5. Insulation for miscellaneous voids.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 1. Zinc-coated (galvanized) steel sheet.
 - 2. Aluminum sheet.
 - 3. Aluminum extrusions and tubes.
 - 4. Equipment supports.
 - 5. Vent pipe extensions.
 - 6. Aluminum ladders and anchors.
 - 7. Isolation barrier membrane.
 - 8. Insulation for miscellaneous voids.
- B. Shop Drawings: For roof accessories. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
- C. Coordinate construction operations on or adjacent to roof, included in different Sections, which depend on each other for proper installation, connection, and operation.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.
- B. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
 - 1. Mill Finish: As manufactured.
- C. Aluminum Extrusions and Tubes: ASTM B 221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used, otherwise mill finished.

2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches thick.
- C. Isolation Barrier membrane: Self-adhering, high-temperature sheet, minimum 15 mils thick, consisting of cross-laminated polyethylene-film top surface laminated to layer of butyl adhesive, with release-liner backing; cold applied, in roll width to match or exceed width of area to be protected. Provide primer when recommended by membrane manufacturer.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. Grace Construction Products, a unit of W. R. Grace & Co.; "Vycor Pro".
- b. Equivalents meeting requirements of specified products."
- D. Fasteners: Screws complying with ASME B18.6.1, Series 300 stainless steel, non-magnetic, torx or square drive, #10, length as required to provide minimum embedment of 1 ½" into substrate. Use stainless steel washers.
- E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- F. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- G. Insulation for Miscellaneous Voids:
 - 1. Spray Polyurethane Foam Insulation for Miscellaneous Voids: ASTM C 1029, Type II, closed cell, minimum density of 1.75 lb/cu. ft. and minimum aged R-value at 1-inch thickness of 6.0 deg F x h x sq. ft./Btu at 75 deg F, with maximum flame-spread and smoke-developed indexes of 25 and 400, respectively, per ASTM E 84.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Dow Chemical Company (The); Froth-Pak Foam Insulation, or comparable product.

2.3 EQUIPMENT SUPPORTS

- A. Equipment Supports: Internally reinforced metal equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints and integrally formed deck-mounting flange at perimeter bottom.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Pate Company (The); ES-2 or comparable product by one of the following:
 - a. Conn-Fab Sales Incorporated.
 - b. Thybar Corporation.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported. Provide equipment supports in pairs of equal length unless otherwise noted.
- C. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch thick.
 - 1. Finish: Mill phosphatized.

D. Construction:

- 1. Factory-installed continuous wood nailers 5-1/2 inches wide at tops of equipment supports.
- 2. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as equipment support.
- 3. Fabricate equipment supports to minimum height of 12 inches unless otherwise indicated.

2.4 VENT PIPE EXTENSIONS

- A. Vent Pipe Extensions: Prefabricated plumbing vent pipe extensions. PVC pipe with integral sixinch long joint splice sleeve insert at each end. Verify existing pipe size in field.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Tubos, Inc.; TUBOS Vent Pipe Extensions, or a comparable product.

2.5 ALUMINUM LADDER

A. General:

1. Comply with ANSI A14.3 unless otherwise indicated.

B. Aluminum Ladder:

- 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. ACL Industries, Inc. (UPNOVR)
 - b. Precision Ladders, LLC.
 - c. Roof Lines, Fayetteville, NY
- 2. OSHA and ANSI A14.3 compliant.
- 3. Mill finish.
- 4. 1,000 pound (minimum) loading capacity.
- 5. Space siderails 24 inches apart unless otherwise indicated.
- 6. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick with "walk-through" handrail extensions..
- 7. Rungs: Extruded-aluminum tubes, not less than 3/4 inch deep and not less than 1/8 inch thick, with ribbed slip resistant tread surfaces.
- 8. Fit rungs in centerline of siderails; fasten by fully welding.
- 9. Support each ladder at top and bottom and not more than 48 inches o.c. with fully welded aluminum brackets.
- 10. Provide vertical side rail handrail extension loops above fascia elevation as shown on drawings.
- 11. Provide 3/8" stainless steel fasteners ladder to be attached to masonry wall.
- 12. Chemical Anchor Adhesives: Heavy duty, two component injectable adhesive designed to be dispensed using double chamber gun with mixing nozzle. Adhesives in capsule form will not be accepted.

- a. Products for anchoring into masonry: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti, Inc.; Hit-HY 70.
 - 2) ITW Redhead; Epcon C6; Epcon A7.
 - 3) Powers Fasteners, Inc.; AC100+ Gold.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 - 2. Anchor roof accessories securely to supporting substrates with specified fasteners at spacing not to exceed 12 inches on center.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Install isolation barrier membrane between metal and wood blocking, wrinkle free. Apply primer if required by membrane manufacturer. Use primer rather than nails for installing membrane at low temperatures. Overlap edges not less than 3-1/2 inches. Roll laps with roller. Cover membrane within 14 days.
- C. Equipment Support Installation: Install equipment supports so top surfaces are level and parallel with each other.
- D. Vent Pipe Extension Installation: Install prefabricated vent pipe extensions according to manufacturer's written installation instructions.

- E. Aluminum Ladder Installation: Provide stainless steel anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide chemical anchors for use with concrete and masonry inserts.
- F. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
- B. Clean exposed surfaces according to manufacturer's written instructions.
- C. Clean off excess sealants.
- D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 72 00

SECTION 07 84 13 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in horizontal assemblies.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in horizontal assemblies.
- B. Sustainable Design Submittals:
 - 1. Product Data: For sealants, indicating VOC content.
- C. Product Schedule: For each penetration firestopping system. Include type of penetration, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.6 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approval according to FM Approval 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.
- C. Notify Owner at least seven days in advance of time when Work that requires testing or inspecting will be performed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."

- B. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E 84.
 - 1. Sealant shall have a VOC content of 250 g/L or less.
- C. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of zero as determined by ASTM G 21.

2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
 - 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. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. RectorSeal.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.
 - 2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
 - 1. Permanent forming/damming/backing materials.
 - 2. Substrate primers.
 - 3. Collars.
 - 4. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

2.4 MIXING

A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping 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 the Work.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with 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 penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
 - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning Penetration Firestopping Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping 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 penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

3.7 PENETRATION FIRESTOPPING SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHEZ.
- B. For each location where a penetration occurs, provide a firestopping system selected from the floor and wall system below that complies with this Section and is suitable for the penetration conditions indicated for the Project.

FIRESTOPPING		FLOOR JSING THE ALPHA-A		DENTIFICATION	
		STEM PUBLISHED I			
	UL'S FIRE RESISTANCE DIRECTORY, VOLS. 2A - 2B FLOOR PENETRATION SYSTEMS (FIRST ALPHA COMPONENT = C OR F)				
TYPE OF PENETRANT	CONCRETE FLOORS WITH A MINIMUM THICKNESS LESS THAN OR EQUAL TO 5 INCHES (127 MM)	CONCRETE FLOORS WITH A MINIMUM THICKNESS OF MORE THAN 5 INCHES (127 MM)	FRAMED FLOORS	FLOOR-CEILING ASSEMBLIES CONSISTING OF CONCRETE WITH MEMBRANE PROTECTION	
O PENETRATING	C-AJ-0001-0999 or F-A-0001-0999	C-BJ-0001-0999 or F-B-0001-0999	F-C-1001-1999		
METALLIC PIPE, CONDUIT, OR FUBING	C-AJ-1001-1999 or F-A-1001-1999	C-BJ-1001-1999, C-BK-1001-1999, or F-B-1001-1999	F-C-1001-1999	F-E-1001-1999	
NONMETALLIC PIPE, CONDUIT, OR TUBING	C-AJ-2001-2999 or F-A-2001-2999	C-BJ-2001-2999, C-BK-2001-2999, or F-B-2001-2999	F-C-2001-2999	F-E-2001-2999	
ELECTRICAL CABLES	C-AJ-3001-3999 or F-A-3001-3999	C-BJ-3001-3999, C-BK-3001-3999, or F-B-3001-3999	F-C-3001-3999	F-E-3001-3999	
CABLE TRAYS WITH ELECTRICAL CABLES	C-AJ-4001-4999 or F-A-4001-4999	C-BJ-4001-4999 or F-B-4001-4999			
INSULATED PIPES	C-AJ-5001-5999 or F-A-5001-5999	C-BJ-5001-5999, C-BK-5001-5999, or F-B-5001-5999	F-C-5001-5999	F-E-5001-5999	
MISCELLANEOUS ELECTRICAL PENETRANTS	C-AJ-6001-6999 or F-A-6001-6999	C-BJ-6001-6999			
MISCELLANEOUS MECHANICAL PENETRANTS	C-AJ-7001-7999 or F-A-7001-7999	C-BJ-7001-7999 or F-B-7001-7999	F-C-7001-7999	F-E-7001-7999	
GROUPINGS OF PENETRATIONS	C-AJ-8001-8999 or F-A-8001-8999	C-BJ-8001-8999 or F-B-8001-8999	F-C-8001-8999	F-E-8001-8999	

WALL FIRESTOPPING SYSTEMS LISTED USING THE ALPHA-ALPHA-NUMERIC IDENTIFICATION SYSTEM PUBLISHED IN					
	UL'S FIRE RESIS	TANCE DIRECTOR			
	WALL PENETRATION SYSTEMS (FIRST ALPHA COMPONENT = C OR W)				
TYPE OF PENETRANT	CONCRETE OR MASONRY WALLS WITH A MINIMUM THICKNESS LESS THAN OR EQUAL TO 8 INCHES (203 MM)	CONCRETE OR MASONRY WALLS WITH A MINIMUM THICKNESS OF MORE THAN 8 INCHES (203 MM)	FRAMED WALLS	COMPOSITE PANEL WALLS	
NO PENETRATING ITEMS	C-AJ-0001-0999, C-BJ-0001-0999, or W-J-0001-0999		W-L-000-1-0999		
METALLIC PIPE, CONDUIT, OR TUBING	C-AJ-1001-1999, C-BJ-1001-1999, or W-J-1001-1999	C-BK-1001-1999 or W-K-1001-1999	W-L-1001-1999	W-N-1001-1999	
NONMETALLIC PIPE, CONDUIT, OR TUBING	C-AJ-2001-2999, C-BJ-2001-2999, or W-J-2001-2999	C-BK-2001-2999 or W-K-2001-2999	W-L-2001-2999	W-N-2001-2999	
ELECTRICAL CABLES	C-AJ-3001-3999, C-BJ-3001-3999, or W-J-3001-3999	C-BK-3001-3999 or WK-3001-3999	W-L-3001-3999		
CABLE TRAYS WITH ELECTRICAL CABLES	C-AJ-4001-4999, C-BJ-4001-4999, or W-J-4001-4999	W-K-4001-4999	W-L-4001-4999		
INSULATED PIPES	C-AJ-5001-5999, C-BJ-5001-5999, or W-J-5001-5999	C-BK-5001-5999	W-L-5001-5999	W-N-5001-5999	
MISCELLANEOUS ELECTRICAL PENETRANTS	C-AJ-6001-6999, C-BJ-6001-6999, or W-BJ-6001-6999		W-L-6001-6999		
MISCELLANEOUS MECHANICAL PENETRANTS	C-AJ-7001-7999, C-BJ-7001-7999, or W-J-7001-7999		W-L-7001-7999	W-N-7001-7999	
GROUPINGS OF PENETRATIONS	C-AJ-8001-8999, C-BJ-8001-8999, or W-J-8001-8999		W-L-8001-8999		
GROUPINGS OF PENETRATIONS	C-AJ-8001-8999, C-BJ-8001-8999, or W-J-8001-8999		W-L-8001-8999		

END OF SECTION 07 84 13

SECTION 07 84 43 - JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Joints in or between fire-resistance-rated constructions.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Joints in or between fire-resistance-rated constructions.
- B. Sustainable Design Submittals:
 - 1. Product Data: For sealants, indicating VOC content.
- C. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.

1.6 INFORMATIONAL SUBMITTALS

A. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.7 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.10 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.
- C. Notify Owner at least seven days in advance of time when Work that requires testing or inspecting will be performed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."

- B. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
 - 1. Sealant shall have a VOC content of 250 g/L or less.

2.2 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Hilti, Inc. products, or comparable products by one the following:
 - a. 3M Fire Protection Products.
 - b. RectorSeal.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E 1966 or UL 2079.
 - 1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- C. Accessories: Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions 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 the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately to comply with joint firestopping system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.

- 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
- 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by joint firestopping 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.

3.3 INSTALLATION

- A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of joint firestopping system.
- C. Install fill materials for joint firestopping systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by joints.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning Joint Firestopping Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2393.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.
- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping 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 joint firestopping systems complying with specified requirements.

3.7 JOINT FIRESTOPPING SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN.
- B. Head-of-Wall, Fire-Resistive Joint Firestopping Systems:
 - 1. UL-Classified Systems:
 - a. Basis-of-Design: HW-D-0045 and HW-D-0081.

END OF SECTION 07 84 43

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
 - 1. Cylindrical sealant backings.
 - 2. Bond-breaker tape.
 - 3. Primer.
 - 4. Cleaners for nonporous surfaces.
 - 5. Silicone, S, NS, 100/50, NT sealant.
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind 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.
- D. 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.
- E. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Warranties: Executed special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 FIELD 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.
 - 3. 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.

1.8 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace 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 agrees to furnish joint sealants to repair or replace those joint sealants 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 causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, 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 joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content: Sealants and sealant primers shall comply with the following:
 - 1. Architectural sealants shall have a VOC content of 250 g/L or less.
 - 2. Sealants and sealant primers for nonporous surfaces shall have a VOC content of 250 g/L or less.
 - 3. Sealants and sealant primers for porous substrates shall have a VOC content of 775 g/L or less.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range. Multiple colors may be selected.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Chemical Company (The); DOWSIL790 Silicone Building Sealant.
 - b. GE/Momentive Performance Materials Inc.; SCS2700 SilPruf LM.
 - c. Pecora Corporation; 890 NST.
 - d. Tremco Incorporated; Spectrem 1.
 - 2. Joint-Sealant Application: Exterior joints in vertical and horizontal surfaces.
 - a. Exterior Joint Locations:
 - 1) Joints between metal and metal and masonry.
 - 2) Other joints as indicated.

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 C (closed-cell material with a surface skin), Type O (open-cell material) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. 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 performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

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, 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.
- 3. Remove laitance and form-release agents from concrete.
- 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by 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 or primer 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 kind 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 in subparagraphs 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 profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
 - 1. Interior standard steel frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to ANSI/SDI A250.8. (Nominal gage equivalents are listed in parentheses.)

1.4 COORDINATION

- A. Coordinate anchorage installation 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.
- B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.5 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section and by Division 08 Sections "Door Hardware" and "Glazing" concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.
 - 1. Interior standard steel frames.
 - 2. Frame anchors.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.

- 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 removable stops and glazing. Indicate which side of each door or frame has a removable stop.
- C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.7 INFORMATIONAL SUBMITTALS

A. Field quality control reports.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal doors and frames palletized, packaged, 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.
- C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

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. Ceco Door; Assa Abloy.
 - 2. Curries Company; Assa Abloy.
 - 3. Pioneer Industries.
 - 4. Steelcraft; an Allegion brand.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C.

- 1. 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 according to UL 1784 and installed in compliance with NFPA 105.
- B. Fire-Rated, Borrowed-Lite Assemblies: Assemblies complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 INTERIOR STANDARD STEEL FRAMES

- A. Construct hollow-metal frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At all interior locations.
 - 1. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (16-gage).
 - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Full profile welded in factory.
 - 2. Exposed Finish: Prime.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
 - 3. Postinstalled Expansion Anchor: Minimum 3/8-inch-diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

2.5 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

- B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.
- E. 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 hollow-metal frames of type indicated.
- F. Glazing: Comply with requirements in Division 08 Section "Glazing."
- G. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.6 FABRICATION

- A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
 - 1. Sidelite Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick (26-gage). Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 4. Door Silencers: 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. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

- C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
 - 1. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.
 - 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 and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
 - 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
 - 5. Provide stops for installation 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.

2.7 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

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.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Remove 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. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
 - a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
 - b. Install frames with removable stops located on secure side of opening.
 - c. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 - d. Install door silencers in frames before grouting.
 - 2. Fire-Rated Openings: Install frames according to NFPA 80.
 - 3. Floor Anchors: Secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 - 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
 - 5. 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.
 - 6. Installation Tolerances: Adjust hollow-metal frames 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 and adjust hollow-metal doors accurately in frames, within clearances specified below.
 - 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
 - 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 installation requirements in Division 08 Section "Glazing" and with hollow-metal manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:

- 1. Fire-Rated Door Inspections: Inspect each fire-rated door according to NFPA 80, Section 5.2.
- 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.

3.5 REPAIR

A. 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.

END OF SECTION 08 11 13

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Five-ply flush wood veneer-faced doors for transparent finish.
- 2. Factory finishing flush wood doors.
- 3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section and by Division 08 Sections "Door Hardware" and "Glazing" concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product, including the following:
 - 1. Door core materials and construction.
 - 2. Door face type and characteristics.
 - 3. Door trim for openings.
 - 4. Factory- finishing specifications.

B. Sustainable Design Submittals:

- 1. Product Data: For adhesives, indicating product contains no urea formaldehyde.
- 2. Product Data: For composite wood products, indicating product contains no urea formaldehyde.
- C. 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 location, type, size, fire protection rating, and swing.

- 2. Door elevations, dimension and locations of hardware, lite cutouts, and glazing thicknesses.
- 3. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
- 4. Dimensions and locations of blocking for hardware attachment.
- 5. Dimensions and locations of mortises and holes for hardware.
- 6. Clearances and undercuts.
- 7. Requirements for veneer matching.
- 8. Doors to be factory finished and application requirements.

D. Samples:

- 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
- E. Sample Warranty: For special warranty.

1.6 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

A. Special warranties.

1.8 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 bottom rail with opening number used on Shop Drawings.

1.9 FIELD 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 temperature and relative humidity are maintained at levels designed for building occupants for the remainder of construction period.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of veneer.
 - b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

- 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
- 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Wood Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure in accordance with UL 10C or NFPA 252.
 - 1. 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 above ambient after 30 minutes of standard fire-test exposure.
- B. 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.

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with ANSI/WDMA I.S. 1A.
 - 1. The Contract Documents contain requirements that may be more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.
- B. Adhesives: Do not use adhesives that contain urea formaldehyde.
- C. Composite Wood Products: Products shall be made without urea formaldehyde.

2.3 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Doors:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to:
 - a. Marshfield-Algoma by Masonite Architectural.
 - b. Oshkosh Door Company.
 - c. VT Industries, Inc.
- 2. Performance Grade: ANSI/WDMA I.S. 1A Extra Heavy Duty.

- 3. ANSI/WDMA I.S. 1A Grade: Premium.
- 4. Faces: Single-ply wood veneer not less than 1/50 inch thick.
 - a. Species: White oak.
 - b. Cut: Plain sliced (flat sliced).
 - c. Match between Veneer Leaves: Book match.
 - d. Assembly of Veneer Leaves on Door Faces: Center-balance match.
- 5. Exposed Vertical and Top Edges: Same species as faces Architectural Woodwork Standards edge Type A.
 - a. Fire-Rated Single Doors: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed vertical edges.
 - b. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
 - 1) Screw-Holding Capability: 550 lbf in accordance with WDMA T.M. 10.
- 6. Core for Non-Fire-Rated Doors:
 - a. WDMA I.S. 10 structural composite lumber.
 - 1) Screw Withdrawal, Door Face: 550 lbf.
 - 2) Screw Withdrawal, Vertical Door Edge: 550 lbf.
- 7. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.
 - a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated on Drawings as needed to eliminate through-bolting hardware.
- 8. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

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: Flush rectangular beads.
 - 3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated.
 - 1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 - 2. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
 - 1. Locate hardware to comply with DHI-WDHS-3.
 - 2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
 - 3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
 - 4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
- C. Openings: Factory cut and trim openings through doors.
 - 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 Division 08 Section "Glazing."

2.6 FACTORY FINISHING

- A. Comply with referenced quality standard for factory finishing.
 - 1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 2. Finish faces, all four edges, edges of cutouts, and mortises.
 - 3. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Transparent Finish:
 - 1. ANSI/WDMA I.S. 1A Grade: Premium.
 - 2. Finish: ANSI/WDMA I.S. 1A TR-8 UV Cured Acrylated Polyester/Urethane
 - 3. Staining: As selected by Architect from manufacturer's full range.
 - 4. Effect: Filled finish.
 - 5. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

- 1. Verify that installed 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.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in accordance with NFPA 80.
 - 2. Install smoke- and draft-control doors in accordance with 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:
 - 1. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.
- 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.

3.4 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that 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 08 14 16

SECTION 08 33 13 - COILING COUNTER DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire-rated counter door assemblies.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type and size of coiling counter door and accessory.
 - 1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
 - 3. Include description of automatic closing device and testing and resetting instructions.
- B. As-Specified Data: If the product to be incorporated in the Work is as specified by manufacturer name and product designation in this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below, otherwise submit full Product Data for the following:
 - 1. Fire-rated counter door assemblies.
- C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
 - 1. Include plans, elevations, sections, and mounting details.
 - 2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
 - 4. Show locations of controls, locking devices, detectors or replaceable fusible links, and other accessories.
 - 5. Include diagrams for power, signal, and control wiring.

- D. Samples: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
 - 1. Include Samples of laminate-clad counter panel product for each type, color, pattern, and surface finish.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For coiling counter doors to include in maintenance manuals.
- B. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain coiling counter doors from single source from single manufacturer.
 - 1. Obtain operators and controls from coiling counter door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Complying with NFPA 80; listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.
 - 1. Smoke Control: In corridors and smoke barriers, provide doors that are listed and labeled with the letter "S" on the fire-rating label by a qualified testing agency for smoke- and draft-control based on testing according to UL 1784; with maximum air-leakage rate of 3.0 cfm/sq. ft. of door opening at 0.10 inch wg for both ambient and elevated temperature tests.
 - 2. Stainless Steel Finish: ASTM A480/A480M No. 4 (polished directional satin).

2.3 FIRE-RATED COUNTER DOOR ASSEMBLY

- A. Fire-Rated Counter Door: Overhead fire-rated coiling door formed with curtain of interlocking metal slats.
 - 1. <u>Products:</u> Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - a. <u>Clopay Building Products Co.; Model CERC11 Smoke Resistant Rolling Counter</u> Fire Doors.
 - b. CornellCookson, LLC; Model ERC11 SmokeShield Rolling Counter Fire Shutters.
 - c. Wayne-Dalton Corp.; FireStar Model 550 Fire-Rated Counter Shutters.
- B. Fire Rating: 3/4 hour with smoke control.
- C. Door Curtain Material: Stainless steel.
- D. Door Curtain Slats: Flat profile slats of 1-1/2-inchto 2-inch center-to-center height.
- E. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats.
- F. Hood: Match curtain material and finish.
- G. Mounting: Face of wall.
- H. Sill Configuration: Fire-rated, laminate counter.
- I. Electric Door Operator:
 - 1. Usage Classification: Medium duty, up to 12 cycles per hour and up to 50 cycles per day.
 - 2. Operator Location: As indicated on Drawings.
 - 3. Motor Exposure: Interior.
 - 4. Motor Electrical Characteristics:
 - a. Horsepower: 1/2 hp.
 - b. Voltage:
 - 1) 115-V ac, single phase, 60 Hz.
 - 5. Auxiliary Manual Operation: Push-up type.
 - 6. Obstruction-Detection Device: Automatic electric sensor edge on bottom bar; self-monitoring type.
 - a. Sensor Edge Bulb Color: Black.

- 7. Control Station(s): Where indicated on Drawings.
- 8. Other Equipment: Audible and visual signals.
- J. Curtain Accessories: Equip door with smoke seals, automatic closing device, astragal and push/pull handles.

K. Door Finish:

1. Stainless Steel Finish: ASTM A480/A480M No. 4 (polished directional satin).

2.4 MATERIALS, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 DOOR CURTAIN MATERIALS AND FABRICATION

- A. Door Curtains: Fabricate coiling counter door curtain of interlocking metal slats in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Stainless Steel Door Curtain Slats: ASTM A240/A240M or ASTM A666, Type 304; sheet thickness of not less than 0.0313 inch (22 gage); and as required.
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.6 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Stainless Steel: Not less than 0.025-inch-thick (24 gage), stainless steel sheet, Type 304, complying with ASTM A240/A240M or ASTM A666.
 - 2. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.
- B. Integral Frame, Hood, and Fascia: Welded sheet metal assembly of the following sheet metal(s):
 - 1. Stainless Steel: Type 304, complying with ASTM A240/A240M or ASTM A666.

2.7 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: As standard with manufacturer and keyed to building keying system.
 - 2. Keys: Two for each cylinder.
- B. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.8 CURTAIN ACCESSORIES

- A. Smoke Seals: Equip each fire-rated door with replaceable smoke-seal perimeter gaskets or brushes for smoke and draft control as required for door listing and labeling by a qualified testing agency.
- B. Astragal: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- C. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
- D. Automatic-Closing Device: Equip each fire-rated door with an automatic-closing device or holder-release mechanism and governor unit complying with NFPA 80 and an easily tested and reset release mechanism. Automatic-closing device shall be designed for activation by the following:
 - 1. Replaceable fusible links with temperature rise and melting point of 165 deg F Insert temperature interconnected and mounted on both sides of door opening.
 - 2. Building fire-detection, smoke-detection, and -alarm systems.

2.9 COUNTER DOOR ACCESSORIES

A. Fire-Rated, Laminate Counter: Fire-door manufacturer's high-pressure, decorative laminate-covered countertop; UL or ITS tested and labeled for 1-1/2-hour fire rating for approved use with fire-door assembly.

2.10 COUNTERBALANCE MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.

- C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
 - 1. Fire-Rated Doors: Equip with auxiliary counterbalance spring and prevent tension release from main counterbalance spring when automatic closing device operates.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.11 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
 - 1. Comply with NFPA 70.
 - 2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.
- C. Door Operator Location(s): Operator location indicated for each door.
- D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated for each door assembly.
 - 1. Electrical Characteristics: Minimum as indicated for each door assembly. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
 - 2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
 - 3. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- F. Obstruction-Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For fire-rated doors, activation delays closing.

- 1. Electric Sensor Edge: Automatic safety sensor edge, located within astragal mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Self-Monitoring Type: Four-wire-configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.
- G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."
 - 1. Type: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf.
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

2.12 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.13 STAINLESS STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3. Directional Satin Finish: ASTM A480/A480M No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION, GENERAL

- A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install coiling counter doors, hoods, controls, and operators at the mounting locations indicated for each door.
- C. Fire-Rated Doors: Install according to NFPA 80.
- D. Smoke-Control Doors: Install according to NFPA 80 and NFPA 105.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and to furnish reports to Architect.
- B. Perform the following tests and inspections:
 - 1. Test door release, closing, and alarm operations when activated by smoke detector or building's fire-alarm system. Test manual operation of closed door. Reset door-closing mechanism after successful test.
 - 2. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, section 5.2.
- 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.

3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. After electrical circuitry has been energized, operate doors to confirm proper motor rotation and door performance.
 - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.5 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide tight fit around entire perimeter.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain coiling counter doors.

END OF SECTION 08 33 13

SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Storefront framing.
 - 2. Swing entrance doors.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section and by Division 08 Sections "Door Hardware" and "Glazing" concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 1. Entrance door hardware.
 - 2. Accessories.
- B. As-Specified Data: If the product to be incorporated in the Work is as specified by manufacturer name and product designation in this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below, otherwise submit full Product Data for the following:
 - 1. Thermally broken exterior framing.
 - 2. Nonthermal interior framing.
 - 3. Thermal exterior entrance doors.
 - 4. Nonthermal interior entrance doors.
 - 5. Flush entrance doors.
- C. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.

- 2. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- 3. Show provisions for coordination with door hardware, electrically operated door hardware, and access control and security systems.
- D. Samples: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- F. Warranties: Sample of Project-specific special warranties.

1.5 INFORMATIONAL SUBMITTALS

- A. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Energy performance values for each exterior aluminum-framed entrance and storefront meeting specified NFRC requirements.
- B. Performance Reports: For FRP doors, showing compliance with fire-performance and door construction requirements.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals
- B. Warranties: Executed special warranties.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. 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.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or 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. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, and entrance doors when available, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design aluminum-framed entrances and storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.

C. Structural Loads:

- 1. Wind Speed:
 - a. Ultimate design wind speed (3-second gust) as indicated on Drawings.
 - b. Nominal design wind speed (3-second gust) as indicated on Drawings.
- 2. Wind Loads: As indicated on Drawings.
- 3. Other Loads: As indicated on Drawings.
- D. Deflection of Framing Members: At design wind pressure, as follows:
 - 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus ¼ inch for spans of greater than 13 feet 6 inches. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.
 - a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.
- E. Structural: Test according to ASTM E 330/E 330M as follows:
 - 1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- F. Air Infiltration: Test according to NFRC 400 or ASTM E 283 for infiltration as follows:
 - 1. Exterior Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
 - 2. Exterior Entrance Doors:
 - a. Single Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
- G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
 - 1. No evidence of water penetration through exterior fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft.

- H. Energy Performance: Certify and label energy performance according to NFRC as follows:
 - 1. Thermal Transmittance (U-factor): NFRC 100 maximum U-factor as follows:
 - a. For exterior fixed glazing and framing areas as a system: 0.38 Btu/sq. ft. x h x deg F.
 - b. For exterior entrance doors: 0.77 Btu/sq. ft. x h x deg F.
 - 2. Solar Heat Gain Coefficient (SHGC): Exterior fixed glazing and framing areas as a system shall have SHGC of no greater than 0.40 as determined according to NFRC 200.
- I. Condensation Resistance: Exterior fixed glazing and framing areas as a system shall have a condensation resistance factor (CRF) of no less than 60 as determined according to AAMA 1503.
- J. Windborne-Debris Impact Resistance: Pass missile-impact and cyclic-pressure tests according to ASTM E 1996 for Wind Zone 1 Enhanced.
 - 1. Large-Missile Test: For exterior glazed openings located within 30 feet of grade.
 - 2. Small-Missile Test: For exterior glazed openings located more than 30 feet above grade.
- K. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.3 STOREFRONT SYSTEMS, GENERAL

- A. Types: Provide the following storefront system types in locations indicated on Drawings:
 - 1. Thermally Broken Exterior Framing.
 - 2. Nonthermal Interior Framing.
- B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Glazing System: Retained mechanically with gaskets on four sides.
 - 2. Glazing Plane: Center.
 - 3. Finish: Clear anodic finish.
 - 4. Fabrication Method: Field-fabricated stick system.
 - 5. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 6. Steel Reinforcement: As required by manufacturer.
- C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.4 THERMALLY BROKEN EXTERIOR FRAMING – 4 ½-INCH WIDTH

- A. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:
 - 1. EFCO Corporation; Xtherm Series 403X.
 - 2. Kawneer: Trifab 451 UT.
 - 3. Special-Lite, Inc.; SL-450 TB.
 - 4. YKK AP America Inc.; YES 45 XT.
- B. Framing Size: 2-inch by 4-1/2-inch (Locations as indicated on Drawings).

2.5 THERMALLY BROKEN EXTERIOR FRAMING – 6-INCH WIDTH

- A. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:
 - 1. EFCO Corporation; Xtherm Series 406X.
 - 2. Kawneer; Trifab 601UT.
 - 3. Special-Lite, Inc.; SL-600 TB.
 - 4. YKK AP America Inc.; YES 60 XT.
- B. Framing Size: 2-inch by 6-inch (Locations as indicated on Drawings).

2.6 NONTHERMAL INTERIOR FRAMING

- A. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:
 - 1. EFCO Copropration; Series 402.
 - 2. Kawneer; Trifab VersaGlaze 450 2-inch sightline.
 - 3. Special-Lite, Inc.; SL-245 FG.
 - 4. YKK AP America Inc.; YES 45 FI (single glazed).
- B. Framing Size: 2-inch by 4-1/2-inch.

2.7 ENTRANCE DOOR SYSTEMS, GENERAL

- A. Types: Provide the following entrance door types in locations indicated on Drawings:
 - 1. Thermal Exterior Entrance Doors.
 - 2. Nonthermal Interior Entrance Doors.
 - 3. Flush Entrance Doors.
- B. Entrance Doors (except Flush Entrance Doors): Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.

- 1. Door Construction: Extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 - a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
- 2. Bottom Rail: Height to comply with accessibility requirements.
- 3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide nonremovable glazing stops on outside of door.
- C. Flush Entrance Doors: Manufacturer's flush entrance doors for swing operation.
 - 1. Door Construction: 0.120-inch-thick pebble-textured fiberglass reinforced polyester (FRP) face sheet with poured-in-place or frothed-in-place urethane insulation and interlocked into extruded-aluminum rail and stile members to conceal edges of face sheets.
 - a. FRP door construction must comply with IBC 2603.4.1.7 or have special approval per IBC 2603.9.
 - 2. Surface-Burning Characteristics: For FRP face sheets facing the interior, surface-burning characteristics as follows when tested by a qualified testing agency according to ASTM E 84. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 3. Color and Gloss: As selected by Architect from manufacturer's full range.

2.8 THERMAL EXTERIOR ENTRANCE DOORS

- A. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:
 - 1. EFCO Corporation; Series D302 ThermaStile.
 - 2. Kawneer; 350T Insulpour.
 - 3. YKK AP America Inc.; MegaTherm 35 XT.
- B. Depth: 2- to 2-3/8-inch.
- C. Door Design: Medium stile, 3-1/2-inch nominal width.

2.9 NONTHERMAL INTERIOR ENTRANCE DOORS

A. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:

- 1. EFCO Corporation; Series D300.
- 2. Kawneer; 350 Standard.
- 3. YKK AP America Inc.; Model 35D.
- B. Depth: 1-3/4-inch.
- C. Door Design: Medium stile, 3-1/2-inch nominal width.

2.10 FLUSH ENTRANCE DOORS

- A. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:
 - 1. FRP Architectural Doors Inc.; FD25 Heavy Duty FRP Faced Door.
 - 2. Special-Lite, Inc.; SL-17 Pebble Grain FRP/ Aluminum.
- B. Depth: 1-3/4-inch.

2.11 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Division 08 Section "Door Hardware."
- B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door, to comply with requirements in this Section.
 - 1. Opening-Force Requirements:
 - a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
 - b. Accessible Interior Doors: Not more than 5 lbf to fully open door.
- C. Weather Stripping: Manufacturer's standard replaceable components.
 - 1. Compression Type: Made of ASTM D 2000 molded neoprene or ASTM D 2287 molded PVC.
 - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- D. Weather Sweeps: Manufacturer's standard adjustable exterior-door bottom sweep with concealed fasteners on mounting strip.

2.12 GLAZING

- A. Glazing: Comply with Division 08 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.13 MATERIALS

- A. Sheet and Plate: ASTM B 209.
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
- C. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
- D. Structural Profiles: ASTM B 308/B 308M.
- E. Steel Reinforcement:
 - 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.
 - 4. Primer: Manufacturer's standard zinc-rich, 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.

2.14 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch 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.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

2.15 FABRICATION

A. Form or extrude 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. 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. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from interior.
 - 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. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
 - 1. At exterior doors, provide compression weather stripping at surface-applied fixed stops. Blade-type stops are not acceptable.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
 - 1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 - 2. At exterior doors, provide weather sweeps applied to door bottoms.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.16 ALUMINUM FINISHES

A. 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 the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

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 perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

- 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
- 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in full sealant bed, as specified in Division 07 Section "Joint Sealants," to produce weathertight installation.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- F. Install glazing as specified in Division 08 Section "Glazing."
- G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
 - 1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
 - 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.3 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts 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.

3. Alignment:

- 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.
- Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch b. wide, limit offset from true alignment to 1/8 inch.
- Where surfaces are separated by reveal or protruding element of 1 inch wide or c. more, 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.

3.4 MAINTENANCE SERVICE

Entrance Door Hardware: A.

1. 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 entrance door hardware.

END OF SECTION 08 41 13

SECTION 08 43 29 - SLIDING STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes manually operated, sliding storefronts.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section and by Division 08 Section "Door Hardware" and "Glazing" concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each configuration of sliding storefront indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. As-Specified Data: If the product to be incorporated in the Work is as specified by manufacturer name and product designation in this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below, otherwise submit full Product Data for the following:
 - 1. Sliding storefront.
- C. Shop Drawings: For each sliding storefront installation.
 - 1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
- D. Warranties: Sample of Project-specific special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sliding storefronts to include in maintenance manuals.
- B. Warranties: Executed special warranties.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. 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.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings to receive sliding storefronts by field measurements before fabrication.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of sliding storefronts 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 hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain sliding storefronts from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Opening Force: Not more than 5 lbf to fully open door.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Department of Justice "2010 ADA Standards for Accessible Design", ICC A117.1, and building Code in effect for Project.

2.3 SLIDING STOREFRONT ASSEMBLIES

- A. General: Provide manufacturer's sliding storefront indicated including door leaves, sidelites, framing, headers, rollers and roller tracks, and accessories required for a complete installation.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer Company Inc.; Series 1010 Sliding Mall Front, or comparable product, including, but not limited to, products by:
 - a. Oldcastle BuildingEnvelope.

B. Sliding Storefront:

- 1. Floor Track: Not greater than 1/2-inch height, full width of storefront.
- 2. Glazing Stops and Gaskets: Square.
- 3. Glazing: Clear tempered (Type FC). Refer to Division 08 Section "Glazing.".
- 4. Finish framing, door(s), sidelite(s), and header with Class II, clear anodic finish.

2.4 COMPONENTS

- A. Framing Members: Extruded aluminum, minimum 0.070-inch thick and reinforced as required to support imposed loads.
- B. Stile and Rail Doors: 1-3/8-inch-thick, glazed doors with extruded-aluminum tubular stile and rail members. Mechanically fasten corners with reinforcing brackets that are welded or incorporate concealed tie rods that span full length of top and bottom rails. Provide interlocks to sliding and fixed panels.
- C. Sidelites: 1-3/8-inch-deep sidelites with extruded-aluminum tubular stile and rail members matching door design and finish. Provide interlocks to sliding panels.
- D. Glazing: As specified in Division 08 Section "Glazing."
- E. Headers: Fabricated from extruded aluminum and extending full width of storefront.
- F. Rollers and Roller Tracks: Assembly that allows vertical adjustment; consisting of stainless-steel wheels operating on a continuous roller track. Provide minimum of two roller wheel assemblies for each active leaf.
- G. Brackets and Reinforcements: High-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- H. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.5 HARDWARE

A. General: Provide units in sizes and types recommended by sliding storefront entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish.

- B. Pulls: Recessed units on both sides of each operable door.
- C. Weather Stripping: Replaceable components.
 - 1. Compression Type: ASTM D2000, molded neoprene or ASTM D2287, molded PVC.
 - 2. Sliding Type: AAMA 701/702, wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- D. Sweeps: Nylon brush sweep mounted to underside of door bottom.
- E. Hardware not specified in this Section is specified in Division 08 Section "Door Hardware."

2.6 FABRICATION

- A. General: Factory fabricate sliding storefront components to designs, sizes, and thicknesses indicated and to comply with indicated standards.
 - 1. Fabricate aluminum components before finishing.
 - 2. 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.
 - 3. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, finished to match framing.
 - a. Where fasteners are subject to loosening or turning out from structural movements or vibration, use self-locking devices.
 - b. Reinforce members as required to receive fastener threads.
 - 4. 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.
- B. Framing: Provide sliding storefronts as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.
 - 1. Fabricate tubular and channel frame assemblies with welded or mechanical joints. Provide subframes and reinforcement as required for a complete system to support required loads.
 - 2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
 - 3. Form profiles that are straight and free of defects or deformations.
 - 4. Provide components with concealed fasteners and anchor and connection devices.
 - 5. Fabricate components with accurately fitted joints, with ends coped or mitered to produce hairline joints free of burrs and distortion.

- 6. Provide anchorage and alignment brackets for concealed support of assembly from the building structure.
- C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
- D. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."
- E. Hardware: Factory install hardware to the greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.

2.7 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
 - 2. Sheet and Plate: ASTM B209.
- B. Sealants and Joint Fillers: As specified in Division 07 Section "Joint Sealants."
- C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
- B. Apply anodic finishes to formed metal after fabrication unless otherwise indicated.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable.

2.9 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, support, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. General: Install sliding storefronts according to manufacturer's written instructions.
 - 1. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints.
 - 2. Where aluminum contacts dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 3. Where aluminum contacts concrete or masonry, protect against corrosion by painting contact surfaces with bituminous coating.
- B. Install sliding storefronts plumb, true in alignment with established lines and grades, and without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, roller assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
- C. Glazing: Install glazing as specified in Division 08 Section "Glazing."
- D. Sealants: Comply with requirements in Division 07 Section "Joint Sealants" for installing sealants, fillers, and gaskets.
 - 1. Set framing members, floor tracks, and flashings in full sealant bed.
 - 2. Seal perimeter of framing members with sealant.

3.3 ADJUSTING

- A. Adjust operating hardware and moving parts to function smoothly and lubricate as recommended by manufacturer.
- B. Adjust force to open door panels.

3.4 CLEANING AND PROTECTION

- A. Clean glass and metal surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.
- B. Comply with requirements in Division 08 Section "Glazing" for cleaning and protecting glass.

END OF SECTION 08 43 29

SECTION 08 46 00 – FIRE-RATED GLAZED OPENING ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire-resistance-rated storefront systems.

1.3 DEFINITIONS

- A. Fire-Protection Rating: The period of time that an opening protective will maintain the ability to confine a fire as determined by tests specified in Section 716 of the building Code in effect for the Project.
- B. Fire-Rated Glazed Opening Assemblies: Glazed opening assemblies configured as either possessing a fire-protection rating or a fire-resistance rating.
- C. Fire-Resistance Rating: The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by tests, or the methods based on tests, prescribed in Section 703 of the building Code in effect for the Project.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section and by Division 08 Section "Glazing" concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 1. Accessories.
- B. As-Specified Data: If the product to be incorporated into Project is as specified by manufacturer name and product designation in Part 2 of this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below, otherwise submit full Product Data for the following:
 - 1. Fire-resistance-rated storefront systems, 60-minute, interior.

- C. Shop Drawings: For fire-rated glazed opening assemblies. Include plans, elevations, sections, full-size details, and attachments to other work.
- D. Samples: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Product Schedule: For fire-rated glazed opening assemblies. Use same designations as indicated on Drawings.
- F. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For fire-rated glazed opening assemblies to include in maintenance manuals.
- B. Executed Warranty: For special warranty.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. 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.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of fire-rated glazed opening 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, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain framing from single source from single manufacturer and glazing from single manufacturer acceptable in writing from the framing manufacturer, for each firerated glazed opening assembly.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of fire-rated glazed opening assemblies representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Fire-rated glazed opening assemblies shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
- B. Fire-Resistance-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-resistance ratings indicated, based on testing according to ASTM E119 or UL 263.

2.3 FIRE-RESISTANCE-RATED STOREFRONT SYSTEMS

- A. Fire-Resistance-Rated Storefront Systems: 60-minute, interior, fire-resistance-rated storefront systems. Provide the following:
 - 1. Steel Units:
 - a. Products: Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - 1) Technical Glass Products; Fireframes Heat Barrier Series and Bullet Resistant (where used with SFRL glazing).
 - a) Glazing for Interior Units: Technical Glass Products; Pilkington Pyrostop (Glass Type FRI) and, where indicated, School Guard Glass SG5 laminated to Pilkington Pyrostop (Glass Type SFRL) as specified in Division 08 Section "Glazing."
 - b) Finish: High-performance organic finish.

2.4 GLAZING

- A. Glazing: Comply with Division 08 Section "Glazing."
- B. Glazing Gaskets: As recommended by manufacturer.
- C. Glazing Sealants: As recommended by manufacturer.

2.5 MATERIALS

A. Aluminum:

- 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/B 429M.
- 4. Structural Profiles: ASTM B 308/B 308M.

B. Steel:

- 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.
- 4. Primer: Manufacturer's standard zinc-rich, 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.

2.6 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch 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.
- C. Corner Covers: Sheet aluminum in sizes and configurations indicated on Drawings, with concealed anchorage installation.
- D. Frame Covers: Sheet aluminum in sizes and configurations indicated on Drawings.

E. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

2.7 FABRICATION

- A. Form or extrude 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. 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. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from interior.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual" 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. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.10 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

- B. High-Performance Organic Finish: Two-coat fluoropolymer finish containing not less than 70 percent 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.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

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. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

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 perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

- 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
- 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in full sealant bed, as specified in Division 07 Section "Joint Sealants," to produce weathertight installation.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install glazing as specified in Division 08 Section "Glazing."

3.3 ERECTION TOLERANCES

- A. Erection Tolerances: Install fire-rated glazed opening assemblies 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.
 - 3. 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 more, 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.

END OF SECTION 08 46 00

SECTION 08 56 43 – SLIDING WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Sliding windows.

1.3 COORDINATION

A. Coordinate installation of anchorages for windows. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, 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.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, weights and finishes for window units.
 - 1. Sliding windows.
- B. Shop Drawings: For security windows.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Hardware for sliding window units.
 - 3. Glazing details.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Pack windows in wood crates for shipment.
- B. Label window packaging with drawing designation.
- C. Store crated windows on raised blocks to prevent moisture damage.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 SLIDING WINDOWS

- A. Provide sliding windows.
 - 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. Quikserv Corp.
 - b. Ready Access, Inc.
- B. Configuration: Two glazed panels that slide horizontally and meet at center of window and two fixed panels.
- C. Operation: Manual open/manual closing.
- D. Framing: Fabricate perimeter framing, mullions, and glazing stops from aluminum.
- E. Sliding Window Hardware: Provide roller track designed for overhead support of manufacturer's standard carrier supporting horizontal-sliding glazed panel. Provide pull and lock with two keys for each horizontal-sliding glazed panel.
- F. Glazing and Glazing Materials: Comply with requirements in Division 08 Section "Glazing" and as follows:
 - 1. Clear insulating glass.

G. Materials:

- 1. Mild Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- 2. Metallic-Coated Steel Sheet: ASTM A653/A653M, CS (Commercial Steel), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.
- 3. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240/A240M, austenitic stainless steel, Type 304.
- 4. Aluminum Extrusions: ASTM B221. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength.
- 5. Aluminum Sheet and Plate: ASTM B209.

2.2 FABRICATION

- A. General: Fabricate windows to provide a complete system for assembly of components and anchorage of window units.
- B. Framing: Miter or cope corners the full depth of framing; weld and dress smooth.
- C. Glazing Stops: Finish glazing stops to match window framing.
- D. Metal Protection: Separate dissimilar metals to protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
- E. Preglazed Fabrication: Preglaze window units at factory, where required for applications indicated. Comply with requirements in Division 08 Section " Glazing."

2.3 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 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. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.4 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.5 ACCESSORIES

- A. Glazing Strips and Weather Stripping: Manufacturer's standard replaceable components.
 - Compression Type: Molded EPDM or neoprene gaskets complying with ASTM D2000, Designations 2BC415 to 3BC620; molded PVC gaskets complying with ASTM D2287; or molded, expanded EPDM or neoprene gaskets complying with ASTM C509, Grade 4.
 - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric backing.
- B. Miscellaneous Glazing Materials: Provide material, size, and shape complying with requirements of glass manufacturers and with a proven record of compatibility with surfaces contacted in installation.
 - 1. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.

- 2. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- 3. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- 4. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- C. Anchors, Clips, and Window Accessories: Stainless steel; hot-dip, zinc-coated steel or iron, complying with ASTM B633.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- E. Sealants: For sealants required within fabricated windows, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating.

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 windows.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing windows to in-place construction.
- B. Fasteners: Install 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 Division 07 Section "Joint Sealants" for installing sealants, fillers, and gaskets.
- D. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.3 ADJUSTING

- A. Adjust horizontal-slidingwindows to provide a tight fit at contact points for smooth operation and a secure enclosure.
- B. Remove and replace defective work, including windows that are warped, bowed, or otherwise unacceptable.

3.4 CLEANING AND PROTECTION

- A. Clean surfaces promptly after installation of windows. Take care to avoid damaging the finish. Remove excess glazing and sealant compounds, dirt, and other substances.
 - 1. Lubricate sliding window hardware.
- B. Clean glass of preglazed windows promptly after installation. Comply with requirements in Division 08 Section "Glazing" for cleaning and maintenance.
- C. Provide temporary protection to ensure that windows are without damage at time of Substantial Completion.

END OF SECTION 08 56 43

SECTION 08 56 53 – SLIDING SECURITY WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Sliding, transaction security windows.

1.3 COORDINATION

A. Coordinate installation of anchorages for security windows. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, 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.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, weights and finishes for window units.
 - 1. Sliding, transaction security windows.
- B. Shop Drawings: For security windows.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Hardware for sliding window units.
 - 3. Glazing details.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of security window indicated as ballistics resistant, for tests performed by a qualified testing agency.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Pack security windows in wood crates for shipment.
- B. Label security window packaging with drawing designation.
- C. Store crated security windows on raised blocks to prevent moisture damage.

1.9 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Attack Resistance: Provide units identical to those tested for compliance with requirements indicated, and as follows:
 - 1. Ballistics Resistance: Listed and labeled as Level 1 when tested according to UL 752.

2.2 SLIDING, TRANSACTION SECURITY WINDOWS

- A. Provide sliding, transaction security windows.
 - 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. Quikserv Corp.
 - b. Ready Access, Inc.
- B. Configuration: One fixed-glazed panel and one horizontal-sliding glazed panel.
- C. Operation: Manual open/self-closing.
- D. Framing: Fabricate perimeter framing, mullions, and glazing stops from aluminum.
- E. Sliding Window Hardware: Provide roller track designed for overhead support of manufacturer's standard carrier supporting horizontal-sliding glazed panel with manufacturer's standard self-closing mechanism mounted in header. Provide self-latching and self-locking pull and lock with two keys for each horizontal-sliding glazed panel. Provide with security bar.

- F. Glazing and Glazing Materials: Comply with requirements in Division 08 Section "Glazing" and as follows:
 - 1. Ballistics-Resistant Glazing:
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Global Security Glazing; Lexgard MP750, or comparable product.
 - b. Three-ply clear, abrasion-resistant polycarbonate and acrylic laminate; UL 752, Level 1.

G. Materials:

- 1. Mild Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- 2. Metallic-Coated Steel Sheet: ASTM A653/A653M, CS (Commercial Steel), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.
- 3. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240/A240M, austenitic stainless steel, Type 304.
- 4. Aluminum Extrusions: ASTM B221. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength.
- 5. Aluminum Sheet and Plate: ASTM B209.

2.3 FABRICATION

- A. General: Fabricate security windows to provide a complete system for assembly of components and anchorage of window units.
 - 1. Provide units that are reglazable from the secure side without dismantling the attack side of framing.
- B. Framing: Miter or cope corners the full depth of framing; weld and dress smooth.
 - 1. Fabricate framing with manufacturer's standard, internal opaque armoring in thicknesses required for security windows to comply with ballistics-resistance performance indicated.
- C. Glazing Stops: Finish glazing stops to match security window framing.
 - 1. Attack-Side (Exterior) Glazing Stops: Welded or integral to framing.
 - 2. Secure-Side (Interior) Glazing Stops: Removable, coordinated with glazing indicated.
- D. Metal Protection: Separate dissimilar metals to protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
- E. Preglazed Fabrication: Preglaze window units at factory, where required for applications indicated. Installation orientation of glazing to meet performance requirements. Comply with requirements in Division 08 Section "Glazing."

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 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. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.6 ACCESSORIES

- A. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.
- B. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch thick; with minimum 1/2-inch-diameter, headed studs welded to back of plate.
- C. Glazing Strips and Weather Stripping: Manufacturer's standard replaceable components.
 - 1. Compression Type: Molded EPDM or neoprene gaskets complying with ASTM D2000, Designations 2BC415 to 3BC620; molded PVC gaskets complying with ASTM D2287; or molded, expanded EPDM or neoprene gaskets complying with ASTM C509, Grade 4.
 - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric backing.
- D. Miscellaneous Glazing Materials: Provide material, size, and shape complying with requirements of glass manufacturers and with a proven record of compatibility with surfaces contacted in installation.
 - 1. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.
 - 2. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
 - 3. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
 - 4. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Anchors, Clips, and Window Accessories: Stainless steel; hot-dip, zinc-coated steel or iron, complying with ASTM B633; provide sufficient strength to withstand design pressures indicated.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

G. Sealants: For sealants required within fabricated security windows, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating.

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 security windows.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of security window connections before security window installation.
- C. Inspect built-in and cast-in anchor installations, before installing security windows, to verify that anchor installations comply with requirements.
 - 1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
 - 2. Perform additional inspections to determine compliance of replaced or additional work.
- D. For factory-installed glazing materials whose orientation (secure or attack side) is critical for performance, verify installation orientation.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
- F. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing security windows to in-place construction. Include threaded fasteners for inserts, security fasteners, and other connectors.
- B. Fasteners: Install security 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 Division 07 Section "Joint Sealants" for installing sealants, fillers, and gaskets.
- D. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.3 ADJUSTING

- A. Adjust horizontal-sliding, transaction security windows to provide a tight fit at contact points for smooth operation and a secure enclosure.
- B. Remove and replace defective work, including security windows that are warped, bowed, or otherwise unacceptable.

3.4 CLEANING AND PROTECTION

- A. Clean surfaces promptly after installation of security windows. Take care to avoid damaging the finish. Remove excess glazing and sealant compounds, dirt, and other substances.
 - 1. Lubricate sliding security window hardware.
- B. Clean glass of preglazed security windows promptly after installation. Comply with requirements in Division 08 Section "Glazing" for cleaning and maintenance.
- C. Provide temporary protection to ensure that security windows are without damage at time of Substantial Completion.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain operable security windows.

END OF SECTION 08 56 53

SECTION 08 62 00 - UNIT SKYLIGHTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Self-flashing unit skylights with integral curbs.
 - 2. Barrel-vaulted skylights for mounting on existing curbs.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section and by Division 07 Section "Roof Accessories" concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of unit skylight. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for unit skylights.
 - 1. Fasteners
 - 2. Dome-type unit skylights with integral curbs.
 - 3. Barrel-vaulted curb mount skylights.
- B. Shop Drawings: For unit skylight work.
 - 1. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work. Include details of provisions for assembly expansion and contraction and for draining moisture within the assembly to the exterior.
- C. Aluminum Finish Samples: For each type of exposed finish required, in a representative section of each unit skylight in manufacturer's standard size.
- D. Glazing Samples: For each color and finish of glazing indicated, 12 inches square and of same thickness indicated for the final Work.

- E. Product Schedule: For unit skylights.
- F. Sample Warranty: For special warranty.

1.6 INFORMATIONAL SUBMITTALS

- A. Energy Performance Certificates: For unit skylights, from manufacturer.
 - 1. Basis for Certification: Energy performance values for each unit skylight meeting specified NFRC requirements.
- B. Product Certificates: For unit skylights indicating compliance with OSHA requirements for fall protection.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For unit skylights.
- B. Warranty: Executed special warranty.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer capable of fabricating unit skylights that meet or exceed performance requirements indicated and of documenting this performance.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of unit skylights that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Uncontrolled water leakage.
 - b. Uncontrolled condensation.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Yellowing of acrylic glazing.
 - e. Breakage of polycarbonate glazing.
 - 2. Warranty Period: Five years from date of Substantial Completion.

2.1 PERFORMANCE REQUIREMENTS

- A. Unit Skylight Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
 - 1. Performance Class and Grade: Class CW-PG 40.
 - 2. Structural Loads: As indicated on Drawings.
 - 3. Certification: AAMA-, WDMA-, or CSA-certified unit skylights with label attached to each.
- B. Thermal Transmittance: NFRC 100 maximum U-factor of 0.50 Btu/sq. ft. x h x deg F.
- C. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum SHGC of 0.40.
- D. Air Infiltration: Maximum air leakage rate of 0.3 cfm/sq. ft. when tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 or NFRC 400.
- E. Condensation Resistance (CR): NFRC 500 minimum of 49.
- F. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone 1 for enhanced protection.
 - 1. Large-Missile Test: For glazing located within 30 feet of grade.
 - 2. Small-Missile Test: For glazing located between 30 feet and 60 feet above grade.
- G. Fall Protection: Provide means to comply with OSHA fall protection requirements, including, at a minimum, safety cage of welded galvanized or stainless-steel wire mesh, 4-inch by 4-inch spacing, for exterior mounting over skylight."

2.2 DOME-TYPE UNIT SKYLIGHTS

- A. General: Provide thermally-broken, factory-assembled unit skylights that include glazing, extruded-aluminum glazing retainers, gaskets, and inner frames and that are capable of withstanding performance requirements indicated.
- B. High Performance Skylights:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Wasco Skylights, part of the Velux Group; EcoSky3 (double acrylic dome—white outer, clear inner dome; polycarbonate-insulating-panel with aerogel) Model E3SA2, or comparable product.
 - a. Acrylic Double-Glazing Profile: Dome, 25 percent rise.
 - 1) Thickness: Not less than required to exceed performance requirements.
 - 2) Outer Glazing Color: White, translucent; Wasco "Satin Sky 2."
 - 3) Inner Glazing Color: Colorless, transparent.

- b. Polycarbonate-Insulating-Panel Glazing:
 - 1) Thickness: 10 mm.
 - 2) Color: Colorless.
 - 3) Fill spaces with aerogel.
- C. Unit Shape and Size: As indicated.
- D. Acrylic Glazing: ASTM D4802, thermoformable, monolithic sheet, category as standard with manufacturer, Finish 1 (smooth or polished), Type UVF (formulated with UV absorber).
 - 1. Self-Ignition Temperature: 650 deg F or more for plastic sheets in thickness indicated when tested according to ASTM D1929.
 - 2. Smoke-Production Characteristics: Smoke-developed index of 450 or less when tested according to ASTM E84, and smoke density of 75 or less when tested according to ASTM D2843.
 - 3. Burning Characteristics: Tested according to ASTM D635. Class CC2, burning rate of 2-1/2 inches per minute or less for nominal thickness of 0.060 inch or thickness indicated for use.
- E. Polycarbonate Glazing: Thermoformable, extruded monolithic sheets, UV resistant, burglar-resistance rated according to UL 972, and with average impact strength of 12 to 16 ft-lb/in. of width when tested according to ASTM D256, Test Method A (Izod).
 - 1. Self-Ignition Temperature: 650 deg F or more for plastic sheets in thickness indicated when tested according to ASTM D1929.
 - 2. Smoke-Production Characteristics: Smoke-developed index of 450 or less when tested according to ASTM E84, and smoke density of 75 or less when tested according to ASTM D2843.
 - 3. Burning Characteristics: Tested according to ASTM D635. Class CC1, burning extent of 1 inch or less for nominal thickness of 0.060 inch or thickness indicated for use.
- F. Polycarbonate-Insulating-Panel Glazing: Manufacturer's standard polycarbonate sheet with cellular cross section that provides isolated airspaces and that is coextruded with a UV-protective layer. Fill airspaces with aerogel.
 - 1. Self-Ignition Temperature: 650 deg F or more for plastic sheets in thickness indicated when tested according to ASTM D1929.
 - 2. Smoke-Production Characteristics: Smoke-developed index of 450 or less when tested according to ASTM E84, and smoke density of 75 or less when tested according to ASTM D2843.
 - 3. Burning Characteristics: Tested according to ASTM D635. Class CC2, burning rate of 2-1/2 inches per minute or less for nominal thickness of 0.060 inch or thickness indicated for use.

- G. Glazing Gaskets: Manufacturer's standard.
- H. Retainer Frame: Aluminum, clear anodic finish.
- I. Curb Frame: PVC or clear anodic finish aluminum.
- J. Integral Curb: Aluminum, self-flashing type.
 - 1. Aluminum Sheet: Alloy and temper to suit structural and finish requirements but not less than 0.032-inch thick.
 - a. Exterior Finish: Mill.
 - b. Interior Finish: Clear anodic.
 - 2. Height: 12 inches.
 - 3. Construction: Double wall, thermally-broken, with aluminum on both faces encasing insulation.
 - 4. Insulation: Manufacturer's standard rigid or semirigid type.
 - a. R-Value: Not less than 5.7 according to ASTM C1363.
- K. Condensation Control: Fabricate unit skylights with integral internal gutters and non-clogging weeps to collect and drain condensation to the exterior.
- L. Thermal Break: Fabricate unit skylights with thermal barrier separating exterior and interior metal framing or with thermal chamber in PVC frame.
- M. Fall Protection: Provide means to comply with OSHA fall protection requirements, including, at a minimum, safety cage of welded galvanized or stainless-steel wire mesh, 4-inch by 4-inch spacing, for exterior mounting over skylight."

2.3 BARREL-VAULTED SKYLIGHTS

- A. General: Provide thermally-broken, factory-assembled barrel-vaulted skylights that include glazing, extruded-aluminum glazing retainers, gaskets, and inner frames and that are capable of withstanding performance requirements indicated. Provide for mounting on existing, modified curbs.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - a. Kingspan Light + Air; Continuous Vaulted Skylight (single polycarbonate outer glazing; polycarbonate-insulating-panel); Model CVTL.
 - 1) Polycarbonate Single-Glazing:
 - a) Thickness: Not less than required to exceed performance requirements.
 - b) Color: White, translucent.

- 2) Polycarbonate-Insulating-Panel Glazing:
 - a) Thickness: 16 mm.
 - b) Color: Colorless.
 - c) Unfilled spaces.
- b. Wasco Skylights, part of the Velux Group; Continuous Vault Skylight (double acrylic glazing—clear outer, white inner; polycarbonate-insulating-panel with aerogel), Model TBVVAPN.
 - 1) Acrylic Double-Glazing:
 - a) Thickness: Not less than required to exceed performance requirements.
 - b) Outer Glazing Color: Colorless, transparent
 - c) Inner Glazing Color: White, translucent.
 - 2) Polycarbonate-Insulating-Panel Glazing:
 - a) Thickness: 16 mm.
 - b) Color: Colorless.
 - c) Fill spaces with aerogel.
- B. Shape and Size: As indicated.
 - 1. Ends: Vertical glazed.
- C. Acrylic Glazing: ASTM D 4802, thermoformable, monolithic sheet, category as standard with manufacturer, Finish 1 (smooth or polished), Type UVF (formulated with UV absorber).
 - 1. Self-Ignition Temperature: 650 deg F or more for plastic sheets in thickness indicated when tested according to ASTM D 1929.
 - 2. Smoke-Production Characteristics: Smoke-developed index of 450 or less when tested according to ASTM E 84, and smoke density of 75 or less when tested according to ASTM D 2843.
 - 3. Burning Characteristics: Tested according to ASTM D 635. Class CC2, burning rate of 2-1/2 inches per minute or less for nominal thickness of 0.060 inch or thickness indicated for use.
- D. Polycarbonate Glazing: Thermoformable, extruded monolithic sheets, UV resistant, burglar-resistance rated according to UL 972, and with average impact strength of 12 to 16 ft-lb/in. of width when tested according to ASTM D256, Test Method A (Izod).
 - 1. Self-Ignition Temperature: 650 deg F or more for plastic sheets in thickness indicated when tested according to ASTM D1929.
 - 2. Smoke-Production Characteristics: Smoke-developed index of 450 or less when tested according to ASTM E84, and smoke density of 75 or less when tested according to ASTM D2843.

- 3. Burning Characteristics: Tested according to ASTM D635. Class CC1, burning extent of 1 inch or less for nominal thickness of 0.060 inch or thickness indicated for use.
- E. Polycarbonate-Insulating-Panel Glazing: Manufacturer's standard polycarbonate sheet with cellular cross section that provides isolated airspaces and that is coextruded with a UV-protective layer. Fill airspaces with aerogel.
 - 1. Self-Ignition Temperature: 650 deg F or more for plastic sheets in thickness indicated when tested according to ASTM D 1929.
 - 2. Smoke-Production Characteristics: Smoke-developed index of 450 or less when tested according to ASTM E 84, and smoke density of 75 or less when tested according to ASTM D 2843.
 - 3. Burning Characteristics: Tested according to ASTM D 635. Class CC2, burning rate of 2-1/2 inches per minute or less for nominal thickness of 0.060 inch or thickness indicated for use.
- F. Glazing Gaskets: Manufacturer's standard.
- G. Aluminum Framing Systems: Manufacturer's standard extruded-aluminum members of thickness required and reinforced as required to support imposed loads.
- H. Aluminum: Alloy and temper as recommended in writing by manufacturer for type of use and finish indicated.
 - 1. Finish: Clear anodic.
- I. Condensation Control: Fabricate barrel-vaulted skylights with integral internal gutters and nonclogging weeps to collect and drain condensation to the exterior.
- J. Thermal Break: Fabricate barrel-vaulted skylights with thermal barrier separating interior metal framing from materials exposed to outside temperature.
- K. Existing Curb: Modified as shown on details.
- L. Fall Protection: Provide means to comply with OSHA fall protection requirements, including, at a minimum, safety cage of welded galvanized or stainless-steel wire mesh, 4-inch by 4-inch spacing, for exterior mounting over skylight."

2.4 ACCESSORY MATERIALS

- A. Fasteners: Screws complying with ASME B18.6.1, Series 300 stainless steel, non-magnetic, torx or square drive, #10, length as required to provide minimum embedment of 1-1/2-inches into substrate. Use stainless steel washers.
 - 1. Where removal of exterior exposed fasteners might allow access to building, provide nonremovable fastener heads.

2.5 ALUMINUM FINISHES

A. 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 and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.,

3.2 INSTALLATION

- A. Coordinate installation of unit skylight with installation of substrates, vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight.
- B. Comply with recommendations in AAMA 1607 and with manufacturer's written instructions for installing unit skylights.
- C. Install unit skylights level, plumb, and true to line, without distortion.
- D. Anchor unit skylights securely to supporting substrates with specified fasteners at spacing not to exceed 12 inches on center.
- E. Install fall protection screen per manufacturer's requirements.
- F. At locations where wood blocking would otherwise be exposed to the building interior, provide aluminum closure trim matching curb interior finish, not less than 0.032-inch thickness. Install from exterior with concealed fasteners prior to setting of unit skylight.

3.3 CLEANING

- A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes.
 - 1. At skylight replacement locations with existing ceiling domes, clean and reinstall existing ceiling domes after completion of skylight replacement.
- B. Remove excess sealants, glazing materials, dirt, and other substances.

- C. Remove and replace glazing that has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

END OF SECTION 08 62 00

SECTION 087100 - DOOR HARDWARE

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. Sliding doors.
 - 3. 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 "Aluminum-Framed Entrances and Storefronts".
- 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:
 - 1. ANSI/BHMA Certified Product Standards A156 Series
 - 2. UL10C Positive Pressure Fire Tests of Door Assemblies

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."
 - 2. 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. 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.
- C. 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.
- D. 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.

- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." If needed 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.
- G. 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
- H. 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. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 3. Five years for exit hardware.
 - 4. Five years for motorized electric latch retraction exit devices.
 - 5. Two years for electromechanical door hardware.

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 certified 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" standard or heavy weight as specified.

- 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: 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 outswinging lockable doors.

5. Manufacturers:

- a. Bommer Industries (BO) LB Series.
- b. Hager Companies (HA) CB Series.
- c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) TA Series.
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge, with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cutouts.
 - 1. Manufacturers:
 - a. Bommer Industries (BO).
 - b. Hager Companies (HA).
 - c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

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 MolexTM 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. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) EL-CEPT Series.
- b. Securitron (SU) EL-CEPT Series.
- c. Stanley Hardware (ST) EPT-12C 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 Products; ASSA ABLOY Architectural Door Accessories (MK) Electrical Connecting Kit: QC-R001.
 - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) Connector Hand Tool: QC-R003.

2. Manufacturers:

- a. Hager Companies (HA) Quick Connect.
- b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) QC-C Series.
- c. Stanley Hardware (ST) WH Series.

2.4 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.
- B. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 - 4. 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.
 - 5. Keyway: Match Facility Standard.
- C. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
 - 1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Conduct specified "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: Field verify and key locks to match Owner's existing system.
- E. Key Quantity: Provide the following minimum number of keys:
 - 1. Construction Keys (where required): Ten (10).
 - 2. Construction Control Keys (where required): Two (2).
- F. Construction Keying: Provide temporary keyed construction cores.
- G. 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.
- H. 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).
- I. Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
 - 1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) ML2000 Series.
 - b. Sargent Manufacturing (SA) 8200 Series.
 - c. Stanley Best (BE) 40H-UN Series.
- B. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.
 - 1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.

- 2. Locks are to be non-handed and fully field reversible.
- 3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 2 million cycles.
- 4. Manufacturers:
 - a. Corbin Russwin Hardware (RU) CL3300 Series.
 - b. Sargent Manufacturing (SA) 10 Line.
 - c. Stanley Best (BE) 9K Series.

2.6 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. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- 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.

2.7 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 - 1. 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.
 - 2. 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.

- 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
- 4. 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.
- 5. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
- 6. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.
- 7. 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.
- 8. 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.
- 9. 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.
- 10. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
- 11. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
- 12. Rail Sizing: Provide exit device rails factory sized for proper door width application.
- 13. 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 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. Manufacturers:
 - a. Corbin Russwin Hardware (RU) ED4000 / ED5000 Series.

- b. Sargent Manufacturing (SA) 80 Series.
- c. Von Duprin (VD) 35A/98 XP Series.
- C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.
 - 1. Provide keyed removable feature where specified in the Hardware Sets.
 - 2. Provide stabilizers and mounting brackets as required.
 - 3. Provide electrical quick connection wiring options as specified in the hardware sets.
 - 4. Manufacturers:
 - a. Corbin Russwin Hardware (RU) 700/900 Series.
 - b. Sargent Manufacturing (SA) 980S Series.
 - c. Von Duprin (VD) 9954 Series.

2.8 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 including installation and adjusting information on inside of cover.
 - 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 in a test witnessed and verified by UL.
 - 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 physically handicapped, 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 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. Manufacturers:

- a. Corbin Russwin Hardware (RU) DC6000 Series.
- b. Sargent Manufacturing (SA) 351 Series.
- c. Norton Door Controls (NO) 7500 Series.

2.9 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.
- 2. 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 certified 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. Burns Manufacturing (BU).
- b. Hiawatha, Inc. (HI).
- c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.10 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 certified 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. Burns Manufacturing (BU).
- b. Hiawatha, Inc. (HI).
- c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.11 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. National Guard Products (NG).
- 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
- 3. Reese Enterprises, Inc. (RE).

2.12 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. 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. Manufacturers:

- a. Securitron (SU) AQL Series.
- b. Altronix (AS) Maximal 11F.

2.13 OPENING LABELS

- A. Provide 1"W x 2"H gloss polyester label imprinted with door mark and QR-type code readable via IR and visible light scan. QR code links to a security credential protected site displaying the installed door opening information. Label constructed with a high-performance, permanent acrylic adhesive resistant to chemicals, smear and scratch, and repeated freeze and thaw cycles. Face stock of label to be white or clear coated, 2.0 mil thickness with tensile strength meeting or exceeding 18,000 psi.
 - 1. Approved Manufacturer: Openings StudioTM Smart Tags (AA).

2.14 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.

2.15 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."

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- 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- 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 Section "Closeout Procedures" for project punch and reporting requirements including compliance with approved submittals and verification door hardware is properly installed, operating and adjusted.
- B. Fire Door Assembly Inspection: Reference Division 01 Sections "Closeout Procedures" and Cash Allowances for stipulations requiring an initial fire door assembly inspection, including documentation reporting, upon completion of door hardware installation according to NFPA 80 Standard for Fire Doors and Other Opening Protectives, paragraph 5.2.4, requirements.

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.

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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 selection for the material and application.
 - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

Hardware Sets

Set: 1.0

Doors: V101-01, V101-03

2 Continuous Hinge	CFM_SLF-HD1 PT x Length Required		PE
1 Removable Mullion	L980S / L980A (As Required) x Length Required	PC	SA
1 Rim Exit Device, Storeroom	16 55 56 64 8804 862	US32D	SA
1 Rim Exit Device, Dummy	16 55 8810 862	US32D	SA
4 Core	By Owner	US15	SA
1 Cylinder	64 980C1	US26D	SA
2 Surface Closer	351 CPS	EN	SA
1 Threshold	273x224AFGT x Length Required x		PE

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	MSES25SS	
2 ElectroLynx Harness - Frame	QC-C1500P	MK
2 ElectroLynx Harness - Door	QC-CXXX (Size as required)	MK
2 Electric Power Transfer	EL-CEPT	SU
2 Position Switch	DPS2 - M / W-BK	SU
1 Wiring Diagram	Elevation and Point to Point as Specified	OT

Notes: Operation:

Set: 2.0

Doors: V101-02, V101-04

1	Continuous Hinge	CFM_SLF-HD1 x Length Required		PE
1	Rim Exit Device, Storeroom	16 64 8804 862	US32D	SA
2	Core	By Owner	US15	SA
1	Surface Closer	351 CPS	EN	SA
1	Threshold	273x224AFGT x Length Required x MSES25SS		PE

Notes: --During set times doors to be manually dogged down via key for push / pull entry for student arrival / departures, and school events.

Set: 3.0

Doors: MS/320-01

1 Continuous Hinge	CFM_SLF-HD1 x Length Required		PE
1 Storeroom/Closet Lock	64 10G04 LL	US26D	SA
1 Core	By Owner	US15	SA
1 Surface Closer	351 CPS	EN	SA
1 Threshold	273x224AFGT x Length Required x MSES25SS		PE

^{*}Door normally closed and secured.

^{*}Upon use of mechanical key or buzzer latch to retract allowing authorized entry.

^{*}Built in request to exit switch to allow authorized egress.

^{*}Door position switches to monitor status of door.

^{*}Upon loss of power door to remain locked.

⁻⁻During set times doors to be manually dogged down via key for push / pull entry for student arrival / departures, and school events.

^{*}Always free egress.

Set: 4.0

Doors: M-35-01

3	Hinge, Full Mortise, Hvy Wt	TA786 [NRP] FT	US26D	MK
1	Office/Entry Lock	64 8205 LL	US26D	SA
1	Core	By Owner	US15	SA
1	Surface Closer	351 UO	EN	SA
1	Kick Plate	K1050 10" high BEV CSK	US32D	RO
1	Electromagnetic Holder	980M 24VDC	689	RF
3	Silencer	608		RO
1	Wiring Diagram	Elevation and Point to Point as Specified		OT

Notes: Operation:

Set: 5.0

Doors: S-64-01

3 Hinge, Full Mortise, Hvy Wt	TA786 [NRP] FT	US26D	MK
1 Classroom Security Lock	64 10G38 LL	US26D	SA
2 Core	By Owner	US15	SA
1 Surface Closer	351 UO	EN	SA
1 Kick Plate	K1050 10" high BEV CSK	US32D	RO
1 Wall Stop	403 (or) 441CU (As Required)	US26D	RO
1 Gasketing	S88D (Head & Jambs)		PE

Set: 6.0

Doors: V101A-01

3 Hinge, Full Mortise	TA714 [NRP] FT	US26D	MK
1 Office/Entry Lock	64 8205 LL	US26D	SA
1 Surface Closer	351 UO	EN	SA
1 Kick Plate	K1050 10" high BEV CSK	US32D	RO
1 Wall Stop	403 (or) 441CU (As Required)	US26D	RO
3 Silencer	608		RO

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^{*}Doors normally held open via electromagnetic hold open.
*Upon loss of power or fire alarm activation magnets to release allowing doors to close and positively latch.

^{*}Always free egress.

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<u>Set: 7.0</u>				
Doors: S-64-02				
 3 Hinge, Full Mortise 1 Passage Latch 1 Surface Closer 1 Kick Plate 1 Wall Stop 3 Silencer 	TA714 [NRP] FT 10U15 LL 351 H K1050 10" high BEV CSK 403 (or) 441CU (As Required) 608	US26D US26D US26D US32D US26D	MK SA SA RO RO	
	<u>Set: 8.0</u>			
Doors: S-64-03				
2 Core	By Owner	US15	SA	
Notes: Balance of hardware by assembly pr	rovider			
Doors: MS/345A-1, MS/346-1, MS/347-1	<u>Set: 9.0</u>			
3 Hinge, Full Mortise	TA714 [NRP] FT	US26D	MK	
1 Storeroom/Closet Lock	64 10G04 LL	US26D	SA	
1 Surface Closer	351 CPS	EN	SA	
1 Gasketing	S88D (Head & Jambs)		PE	
	Set: 10.0			
Doors: MS/400-1, MS/400-2				
2 Continuous Hinge	CFM_SLF-HD1 x Length Required		PE	
2 Flush Bolt	555	US26D	RO	
1 Dust Proof Strike	570	US26D	RO	
1 Storeroom/Closet Lock	64 10G04 LL	US26D	SA	
1 Core	By Owner	US15	SA	
1 Surf Overhead Stop	10-336	630	RF	
1 Surface Closer	351 CPS	EN	SA	
1 Threshold	273x224AFGT x Length Required x MSES25SS		PE	

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Set: 11.0

Doors: Fire Rated Counter Door (W1 at Springhurst Elementary School)

1 Core By Owner US15 SA

Notes: Balance of hardware by assembly provider

END OF SECTION 087100

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
 - 1. Glass for the following applications:
 - a. Doors.
 - b. Interior borrowed lites.
 - c. Fire-rated glazed opening assemblies.
 - d. Storefront framing.
 - e. Other applications as indicated.
 - 2. Glazing sealants and accessories.

1.3 DEFINITIONS

- A. Glass Manufacturers: 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. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- B. Coordinate framing types to provide proper framing fire rating.

1.5 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section and by Division 08 Sections "Hollow Metal Doors and Frames", "Fire-Rated Glazed Opening Assemblies", "Flush Wood Doors", "Aluminum-Framed Entrances and Storefronts", "Sliding Storefronts", and "Sliding Windows" concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated:
 - 1. Insulating Glass Type FC/FC: Clear insulating glass.
 - 2. Insulating Glass Type FCE/HCL: Low-e-coated, clear insulating laminated glass.
 - 3. Insulating Glass Type FCE/HCLW: Low-e-coated, clear windborne-debris-impact resistant insulating laminated glass
 - 4. Insulating Glass Type FCE/SCL: Low-e-coated, laminated-glass security insulating glass.
- B. As-Specified Data: If the product to be incorporated in the Work is as specified by manufacturer name and product designation in this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below; otherwise submit full Product Data for the following:
 - 1. Glass Type FC: Clear fully tempered float glass.
 - 2. Glass Type FPC: Fire-protection-rated laminated ceramic glass.
 - 3. Glass Type FRI: Fire-resistance-rated laminated glass with intumescent interlayers.
 - 4. Glass Type SCL: Clear laminated-glass security glazing.
 - 5. Glass Type SFRL: Fire-resistance-rated laminated-glass security glazing.
- C. Sustainable Design Submittals:
 - 1. Product Data: For sealants, indicating VOC content.
- D. Samples: For each type of the following products; 12 inches square.
 - 1. Coated glass.
 - 2. Laminated glass.
 - 3. Fire-protection-rated glazing.
 - 4. Fire-resistance-rated glazing.
 - 5. Clear laminated-glass security glazing.
 - 6. Fire-resistance-rated laminated-glass security glazing.
 - 7. Insulating glass.
- E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- F. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- G. Warranties: Samples of Project-specific special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Warranties: Executed special warranties.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.9 FIELD 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 glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.10 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of product shipment by manufacturer.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to 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. "Laminated Glass", as used in this paragraph, includes clear laminated glass, fire-protection-rated laminated ceramic glass, fire-resistance-rated laminated glass with intumescent interlayers, clear laminated glass security glazing and fire-resistance-rated laminated-glass security glazing.
 - 1. Warranty Period: Five years from date of product shipment by manufacturer.
- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to 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.
- D. Warranty Period: 10 years from date of product shipment by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
- B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
 - 1. Design Wind Pressures: As indicated on Drawings.
- D. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with enhanced-protection testing requirements in ASTM E 1996 for Wind Zone 1 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.
 - 1. Large-Missile Test: For glazing located within 30 feet of grade.
 - 2. Small-Missile Test: For glazing located more than 30 feet above grade.
- E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- F. Security Glazing: Installed security glazing shall withstand security-related loads and forces without damage to the glazing beyond that allowed by referenced standards.
- G. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. For monolithic-glass lites, properties are based on units with lites 6 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 of thickness indicated for overall unit and for each lite.
 - 4. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F.

5. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW computer program.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose-stream test; whether or not glazing meets 450 deg F temperature-rise limitation; and the fire- rating in minutes.
- E. Fire-Resistance-Rated Glazing Labeling: Permanently mark fire-resistance-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, that the glazing is approved for use in walls, and the fire-resistance rating in minutes.
- F. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
 - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
- G. Strength: Where heat-strengthened float glass is indicated, provide heat-strengthened float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

- 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- 2. Glass Type FC: Clear fully tempered float glass.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - 1) AGC Glass Co. N.A.; (Clear) Float Glass.
 - 2) Guardian Glass, LLC; 6 mm Clear Float Glass.
 - 3) PPG/Vitro Architectural Glass; Clear 6 mm.
 - b. Thickness: 6 mm.
 - c. Safety glazing required.
- 3. Glass Type FCE: Clear fully tempered float glass with low-e coating.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated in the Work, include, but are not limited to:
 - 1) AGC Glass Co. N.A.; Energy Select 28 on Clear.
 - 2) Guardian Glass, LLC; SunGuard SNX 62/27 on 6 mm Clear.
 - 3) PPG/Vitro Architectural Glass; Solarban 70XL on Starphire Ultra-Clear 6 mm.
 - b. Thickness: 6 mm.
 - c. Safety glazing required.
- C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172. 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: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
 - 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 - 3. Interlayer Color: Clear unless otherwise indicated.
 - 4. Appearance: Provide laminated glass without haze and with visual clarity and transparency indistinguishable from clear fully tempered float glass.

- 5. Glass Type HCL: Clear laminated glass with two plies of heat-strengthened float glass.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated in the Work include, but are not limited to:
 - 1) AGC Glass Co. N.A.
 - 2) Guardian Glass, LLC.
 - 3) PPG/Vitro Architectural Glass.
 - b. Thickness of Each Ply: 3 mm.
 - c. Interlayer Thickness: 0.060 inch.
 - d. Safety glazing required.
- B. Windborne-Debris-Impact-Resistant Laminated Glass: Comply with requirements specified above for laminated glass except as noted below for interlayer type.
 - 1. Glass Type **HCLW**: Clear windborne-debris-impact resistant laminated glass with two plies of heat-strengthened float glass.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated in the Work include, but are not limited to:
 - 1) AGC Glass Co. N.A.
 - 2) Guardian Glass, LLC.
 - 3) PPG/Vitro Architectural Glass.
 - b. Thickness of Each Ply: 3 mm.
 - c. Interlayer Type: One of the following to comply with interlayer manufacturer's written instructions:
 - 1) Polyvinyl butyral interlayer.
 - 2) Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
 - 3) Ionomeric polymer interlayer.
 - 4) Cast-in-place and cured-transparent-resin interlayer.
 - 5) Cast-in-place and cured-transparent-resin interlayer reinforced with polyethylene terephthalate film.
 - d. Interlayer Thickness: 0.090 inch.
 - e. Safety glazing required.

2.6 FIRE-PROTECTION-RATED GLAZING

- A. 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.
- B. Appearance: Provide fire-protection-rated glazing without haze and with visual clarity and transparency indistinguishable from clear fully tempered float glass.
- C. Laminated Ceramic Glazing: Laminated glass made from two plies of clear, ceramic glass; and complying with 16 CFR 1201, Category II.
 - 1. Glass Type **FPC**: Fire-protection-rated laminated ceramic glass.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:
 - 1) SaftiFirst; Pyran Platinum L.
 - 2) Technical Glass Products; FireLite Plus.
 - b. Rating: 20 minutes.
 - c. Thickness: 8-9 mm.
 - d. Safety glazing required.

2.7 FIRE-RESISTANCE-RATED GLAZING

- A. Fire-Resistance-Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-resistance ratings indicated, based on testing according to ASTM E 119 or UL 263.
- B. Laminated Glass with Intumescent Interlayers: Laminated glass made from multiple plies of uncoated, ultraclear float glass; with intumescent interlayers; and complying with 16 CFR 1201, Category II.
 - 1. Glass Type **FRI**: Fire-resistance-rated laminated glass with intumescent interlayers.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to:
 - 1) Vetrotech Saint-Gobain; Contraflam 60.
 - b. Rating: 60 minutes.
 - c. Thickness: 23-27 mm.
 - d. Safety glazing required.

2.8 LAMINATED-GLASS SECURITY GLAZING

- A. Laminated-Glass Security Glazing: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Performance Standard: Provide laminated-glass security glazing complying with the following:
 - a. 5-aal assault test-rated for 12 minutes, as a continuous attack.
 - 1) Withstand a minimum of 5 shots from a military-style assault rifle with a minimum caliber of 7.62 mm.
 - 2) Withstand a minimum of abuse as applied by a single assailant at full force and including strikes with feet, bricks, hammers, baseball bats, and sledgehammers without stoppage.
 - b. Failure is defined as a tear in the security glazing large enough to allow an object 4 inches in diameter or more to pass through, or separation made between the glass and surrounding frame.
 - c. Product shall not be damaged or scratched by scissors, writing implements, razor blades, or the use of any similar sharp object.
 - d. Product performance shall be proven by testing with installation in framing of similar type, size and bite, as that required for this Project.
 - 2. Interlayer Thickness: Provide thickness needed to comply with requirements.
 - 3. Interlayer Color: Clear.
 - 4. Appearance: Provide laminated-glass security glazing without haze and with visual clarity and transparency indistinguishable from clear fully tempered float glass.
 - 5. Glass Type SCL: Clear laminated-glass security glazing.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Laminated Technologies Inc.; SG5 by School Guard Glass, or comparable product.
 - b. Safety glazing required.

2.9 FIRE-RESISTANCE-RATED LAMINATED-GLASS SECURITY GLAZING

A. Fire-Resistance-Rated Laminated-Glass Security Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-resistance ratings indicated, based on testing according to ASTM E 119 or UL 263. Comply with ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation. Fire-resistance-rated laminated glass made from multiple plies of uncoated, ultraclear float glass; with intumescent interlayers; and complying with 16 CFR 1201, Category II.

- 1. Glass Type **SFRL**: Fire-resistance-rated laminated-glass security glazing.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Laminated Technologies, Inc.; SG5 by School Guard Glass (Glass Type SCL) laminated to Technical Glass Products; Pilkington Pyrostop (Glass Type FRI), or comparable products.
 - b. Rating: 60 minutes.
 - c. Thickness: As required for rating.
 - d. Interlayer Color: Clear.
 - e. Appearance: Provide fire-resistance-rated laminated-glass security glazing without haze and with visual clarity and transparency indistinguishable from clear fully tempered float glass.
 - f. Safety glazing required.

2.10 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 - 2. Perimeter Spacer: Manufacturer's standard Warm Edge Technology (WET) spacer material and construction, complying with the following:
 - a. Effective Conductivity: 1.0 W/(mK) maximum.
 - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.
 - 4. Interspace Content: Argon (90 percent argon, 10 percent air).
- B. Insulating Glass Type FC/FC: Clear insulating glass.
 - 1. Overall Unit Thickness: 1 inch.
 - 2. Outer and Inner Lites: Clear fully tempered float glass, Type FC.
 - 3. Interspace Content: Air.
- C. Insulating Glass Type FCE/HCL: Low-E-coated, clear insulating laminated glass.
 - 1. Overall Unit Thickness: 1 inch.
 - 2. Outdoor Lite: Clear fully tempered float glass, with low-e coating, Type FCE.
 - 3. Low-E Coating: Sputtered on second surface.
 - 4. Interspace Content: Argon.
 - 5. Indoor Lite: Clear laminated glass with two plies of heat-strengthened float glass, HCL.
 - 6. Winter Nighttime U-Factor: 0.23 Btu/sq. ft. x h x deg F maximum.
 - 7. Visible Light Transmittance: 61 percent minimum.
 - 8. Solar Heat Gain Coefficient: 0.27 maximum.

- D. Insulating Glass Type FCE/HCLW: Low-E-coated, clear windborne-debris-impact resistant insulating laminated glass.
 - 1. Overall Unit Thickness: 1 inch.
 - 2. Outdoor Lite: Clear fully tempered float glass, with low-e coating, Type FCE.
 - 3. Low-E Coating: Sputtered on second surface.
 - 4. Interspace Content: Argon.
 - 5. Indoor Lite: Clear laminated glass with two plies of heat-strengthened float glass, HCLW.
 - 6. Winter Nighttime U-Factor: 0.23 Btu/sq. ft. x h x deg F maximum.
 - 7. Visible Light Transmittance: 61 percent minimum.
 - 8. Solar Heat Gain Coefficient: 0.27 maximum.
- E. Insulating Glass Type FCE/SCL: Low-E-coated, laminated-glass security insulating glass.
 - 1. Overall Unit Thickness: 1 5/16 inch.
 - 2. Outdoor Lite: Clear fully tempered float glass with low-e coating, Type FCE.
 - 3. Low-E Coating: Sputtered on second surface.
 - 4. Interspace Content: Argon.
 - 5. Indoor Lite: Clear laminated-glass security glazing, Type SCL.
 - 6. Winter Nighttime U-Factor: 0.24 Btu/sq. ft. x h x deg F maximum.
 - 7. Visible Light Transmittance: 59 percent minimum.
 - 8. Solar Heat Gain Coefficient: 0.28 maximum.

2.11 GLAZING SEALANTS

A. General:

- 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
- 3. Sealant shall have a VOC content of 250 g/L or less.
- 4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

2.12 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; 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; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.13 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with 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.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of 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. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.14 GLAZING ACCESSORIES FOR FIRE-RATED GLAZING PRODUCTS

A. Provide glazing gaskets, glazing sealants, glazing tapes, setting blocks, spacers, edge blocks, and other glazing accessories that are compatible with glazing products and each other and are approved by testing agencies that listed and labeled fire-rated glazing products with which products are used for applications and fire ratings indicated.

- B. Glazing Sealants for Fire-Rated Glazing Products: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 50, Use NT. Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated.
 - 1. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- C. Perimeter Insulation for Fire-Rated Glazing: Product that is approved by testing agency that listed and labeled fire-rated glazing product with which it is used for application and fire rating indicated.

2.15 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit 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.
 - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.
- C. For fire-rated glazing, examine glazing units to locate fire side and protected side. Label or mark units as needed so that fire side and protected side are readily identifiable. Do not leave visible marks in the completed Work.
- D. For laminated-glass security glazing, examine glazing units to locate attack or threat side and protected side. Label or mark units as needed so that attack or threat side and protected side are readily identifiable. Do not leave visible marks in the completed Work.

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.
 - 1. For fire-rated glazing, use methods approved by testing agencies that listed and labeled fire-rated glazing products.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. 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.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
 - 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.
- G. 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.

- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
 - 1. For fire-resistant glazing, set glass lites with proper orientation so that coatings face fire side or protected side as specified.
- J. For laminated-glass security glazing, set glass lites with proper orientation so that surfaces face attack or threat side or protected side as specified.

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, then to jambs. Cover horizontal framing joints by applying tapes to jambs, 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 right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. 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.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 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.

3.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. 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.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 00

SECTION 08 81 00 – GLAZING FILMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Safety and security window film.
 - 1. Clear microlayered.
- B. Film attachment system.
 - 1. Impact protection adhesive.

1.3 REFERENCES

- A. ASHRAE American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals.
- B. ASTM International (ASTM):
 - 1. ASTM D 882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
 - 2. ASTM D 412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers -- Tension.
 - 3. ASTM D 624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
 - 4. ASTM D 1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
 - 5. ASTM D 1044 Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test).
 - 6. ASTM D 2240 Standard Method for Rubber Property Durometer Hardness.
 - 7. ASTM D 2582 Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting.
 - 8. ASTM D 5895 Standard Test Methods for Evaluating Drying or Curing During Film Formation of Organic Coatings Using Mechanical Recorders.
 - 9. ASTM D 4830 Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing.
 - 10. ASTM E 84 Standard Method of Test for Surface Burning Characteristics of Building Materials.
 - 11. ASTM E 308 Standard Recommended Practice for Spectophotometry and Description of Color in CIE 1931 System.

- 12. ASTM E 903 Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- 13. ASTM E 1886 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- 14. ASTM E 1996 Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
- 15. ASTM F1642 Standard Method of Test for Glazing and Glazing Systems Subject to Airblast Loadings
- 16. ASTM F2912 Standard Specification for Glazing and Glazing Systems Subject to Airblast Loadings.
- 17. NFRC 100/200 (Formerly ASTM E903) Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- C. Window 5.2 A Computer Tool for Analyzing Window Thermal Performance; Lawrence Berkeley Laboratory.
- D. ANSI Z97.1 American National Standard for Safety Glazing Materials Used in Buildings Safety Performance Specifications and Methods of Test.
- E. Consumer Products Safety Commission 16 CFR, Part 1201 Safety Standard for Architectural Glazing Materials.
- F. GSA-TS01 Standard Test for Glazing and Glazing Systems Subject to Airblast Loadings.
- G. ISO 16933, International Standard for Glass in Building: Explosion-resistant security glazing Test and classification for arena air-blast testing.
- H. Underwriters Laboratories Inc. (UL): UL 972 Burglary Resisting Glazing Material.

1.4 PERFORMANCE REQUIREMENTS

- A. Fire Performance: Surface burning characteristics when tested in accordance ASTM E 84:
 - 1. Flame Spread: 25, maximum.
 - 2. Smoke Developed: 450, maximum.
- B. Abrasion Resistance: Film must have a surface coating that is resistant to abrasion such that, less than 5 percent increase of transmitted light haze will result in accordance with ASTM D 1044 using 50 cycles, 500 grams weight, and the CS10F Calbrase Wheel.

1.5 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Samples: For each film specified, two samples, 12 inches square.
- C. Sample Warranty: For special warranty.

1.7 INFORMATIONAL SUBMITTALS

- A. Provide a Glass Stress Analysis of the existing glass and proposed glass/film combination as recommended by the film manufacturer.
- B. Sample Warranty: For special warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For glazing film to include in maintenance manuals.
- B. Warranty: Executed special warranty.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An installer who is authorized by glazing film manufacturer as qualified to install manufacturer's system using trained workers.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass with safety and security glazing film overlay system for adhesion to and compatibility with glass, gaskets, framing members, and other contact materials.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.12 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.13 WARRANTY

- A. At project closeout, provide to Owner or Owner's Representative an executed current copy of the manufacturer's labor and material warranty to include removal and replacement of film and impact protection system to include the following:
 - 1. Maintain solar reflective properties without cracking, crazing or peeling.
 - 2. Maintain adhesion properties without blistering, bubbling or delaminating from the glass.
 - 3. Maintain appearance without discoloration.
 - 4. Maintain strength, tear and penetration properties as defined in product literature.
 - 5. Maintain adhesion of impact protection system.
 - a. Duration: 14 years from date of substantial completion.
- B. Warranty against glass failure due to thermal shock: Labor and material for film, impact protection system and glass replacement for glass breakage caused as a direct result of application of security film.
 - 1. Duration: 60 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: 3M Window Film, which is located at: 3M Center Bldg. 0235-02-S-27, St. Paul, MN 55144-1000; Tel: 800-480-1704; Email:3Mrenewableenergy@mmm.com; Web:www.3m.com/windowfilm

2.2 CLEAR MICROLAYERED SAFETY AND SECURITY WINDOW FILM

- A. 3M Ultra S600: Optically clear micro-layered polyester film, with a durable acrylic abrasion resistant coating over one surface and a pressure sensitive adhesive on the other. The film is clear and will not contain dyed polyester. Film contains at least forty-two micro-layers.
 - 1. Physical / Mechanical Performance Properties:
 - a. Film Color: Clear.
 - b. Thickness: Nominal 6.0 mils (0.15 mm), comprised of 42 micro-layers.

- c. Tensile Strength (ASTM D 882): 30,000 psi.
- d. Break Strength (ASTM D 882) (Per Inch Width): 180 lbs.
- e. Tear Resistance (ASTM D 1004): Greater than 1,150 lbs.
- f. Puncture Propagation Tear (ASTM D 2582): 19.2 lbs.
- g. Young's Modulus (ASTM D 882): 500 kpsi nominal.
- 2. Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.
- 3. Variation in Total Transmission Across the Width: Less than 2 percent over the average at any portion along the length.
- 4. Identification: Labeled as to Manufacturer as listed in this Section.
- 5. Solar Performance Properties: Film applied to 1/4 inch thick clear glass.
 - a. Visible Light Transmission (ASTM E 903): 84 percent.
 - b. Visible Reflection (ASTM E 903): Not more than 10 percent.
 - c. Ultraviolet Transmission (ASTM E 903): Less than 1 percent.
 - d. Solar Heat Gain Coefficient (ASTM E 903): 0.78.
- 6. Impact Resistance for Safety Glazing: Tested on 1/4 inch (6.4 mm) annealed glass.
 - a. Safety Rating (CPSC 16 CFR, Part 1201): Category II (400 ft.-lbs).
 - b. Safety Rating (ANSI Z97.1): Class A, Unlimited Size.
- 7. Windstorm Protection: Film shall pass impact of Medium Large Missile "C" and withstand subsequent pressure cycling (per ASTMs E 1996 and E 1886) at 50 psf Design Pressure with use of 3M Impact Protection Adhesive attachment system.
- 8. Bomb Blast Mitigation: Independent testing with results from high explosive arena blast testing.
 - a. GSA Level 2 rating with minimum blast load of 14 psi overpressure and 70 psi*msec blast impulse.
 - b. GSA Level 3A rating with minimum blast load of 11 psi overpressure and 55 psi*msec blast impulse.
 - c. GSA Level 2 rating with minimum blast load of 10 psi overpressure and 89 psi*msec blast impulse.
 - d. ASTM F1642 "No Hazard" rating with minimum blast load of 6 psi overpressure and 41 psi*msec blast impulse
 - e. ASTM F1642 "Minimal Hazard" rating with minimum blast load of 10 psi overpressure and 89 psi*msec blast impulse

2.3 IMPACT PROTECTION FILM ATTACHMENT SYSTEMS

- A. 3M Impact Protection Adhesive (IPA): Weatherable, UV-resistant, moisture curable structural sealant wet glaze.
 - 1. Color: Black.

2. Material Properties:

- a. Typical Cure Time: 3-7 days (25 degrees C, 50% RH).
- b. Full Adhesion: 7-14 days.
- c. Tack-Free Time (ASTM D 5895): 21 minutes (25 degrees C, 50% RH).
- d. Flow, Sag or Slump (ASTM D 2202): 0 inches.
- e. Specific Gravity: 1.4.
- f. Working Time: 10-20 minutes (25 degrees C, 50% RH).
- g. VOC Content: 16 g/l.
- 3. Material Properties (as cured 21 days at 25 degrees C, 50% RH):
 - a. Ultimate Tensile Strength (ASTM D412): 380 psi (2.62 MPa).
 - b. Ultimate Elongation (ASTM D412): 640 psi.
 - c. Durometer Hardness, Shore A (ASTM D2240): 38-39 points.
 - d. Tear Strength, Die B (ASTM D624): 72 ppi.
- 4. Uniformity: Product shall have uniform consistency and appearance, with no clumping.
- 5. Flammability: Class A Interior Finish for Building Materials.
- 6. Windborne Debris Protection:
 - a. As part of a filmed glass system, film attachment shall demonstrate ability to withstand Medium Large Missile C and Small Missile A impact, with subsequent pressure cycling (per ASTMs E 1996 and E 1886) at 70 psf design pressure.
 - b. As part of a filmed glass system, film attachment shall demonstrate ability to withstand structural load requirements of ASTM E330 when tested at 120 psf design pressure.

7. Bomb Blast Mitigation:

- a. GSA level "2" rating (minimal hazard) of "2" with minimum blast load of 11 psi overpressure and 55 psi msec blast impulse.
- b. GSA level "3B" rating (low hazard) with minimum blast load of 10 psi overpressure and 89 psi msec blast impulse.
- c. ASTM F1642 rating of "Low Hazard" with minimum blast load of 8 psi overpressure and 42 psi msec blast impulse.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Film Examination:

- 1. Notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
 - a. Glass surfaces receiving new film should first be examined to verify that they are free from defects and imperfections, which will affect the final appearance.

- 2. Do not proceed with installation until glass surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
- 3. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

B. Impact Protection Adhesive Examination:

- 1. Notification in writing shall be made of deviations from manufacturer's recommended installation tolerances and conditions.
- 2. Filmed glass surfaces receiving new attachment should first be examined to verify that they are free from defects and imperfections, and that the film edges extend sufficiently to the frame edges.
- 3. Do not proceed with installation until film and frame surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
- 4. Upon request, an adhesion test to the frame surface may be conducted by applying a 4 6 inch long bead, approximately 0.5 1 inch in width, masking one side of the frame surface underneath the strip with tape. Allow the Impact Protection Adhesive to cure for 7 days and test adhesion by pulling up on the masked end and a 90 degree angle. If cohesive failure is observed (adhesive residue left behind on the frame surface), adhesion is acceptable; if adhesive failure is observed (clean peel from the frame), adhesion is unacceptable and product is not recommended.

3.2 PREPARATION

- A. Remove any existing window films and adhesive.
- B. Remove any window treatments, protect and reinstall after completion of work if such treatments will interfere with film installation.
- C. Clean surfaces thoroughly prior to installation.
- D. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- E. Refer to Manufacturer's installation instructions for methods of preparation for Impact Protection Adhesive film attachment systems.

3.3 INSTALLATION

A. Film Installation:

- 1. Install in accordance with manufacturer's instructions.
- 2. Cut film edges neatly and square at a uniform distance of 1/8 inch to 1/16 inch of window sealant. Use new blade tips after 3 to 4 cuts.

- 3. Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
- 4. Apply film to glass and lightly spray film with slip solution.
- 5. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- 6. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
- 7. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

B. Impact Protection Adhesive Installation:

- 1. The film attachment system shall be applied according to the specifications of the Manufacturer by an Authorized Dealer/Applicator. Refer to 3M publication, 70-0709-0322-7, 3M Impact Protection Adhesive Attachment System Installation Instructions.
 - a. Provide minimum 1/2 inch bead overlap on both frame and film (excluding glazing stops or compression gaskets).
- 2. To ensure a straight and consistent bead width is achieved, masking tape may be applied to film and frame surfaces prior to application.
- 3. With prior approval of the Owner, existing compression gaskets may be partially removed or trimmed to allow for a thinner bead and stronger anchorage. If removing the gaskets, sections shall be trimmed approximately 3 inches in length and inserted with appropriate spacing along all sides of the window to help secure the glazing during application and curing of the Impact Protection Adhesive.
- 4. The Impact Protection Adhesive shall be dispensed with a caulk gun with nozzle opening diameter sized to match the approximate size of the desired bead width.
- 5. A plastic putty knife or other tool with a clean straight edge shall be used to trowel and smooth out the adhesive. The completed adhesive bead shall be relatively triangular in shape.
- 6. Any masking tape used shall be carefully removed within 10 minutes after applying the wet glaze.

3.4 CLEANING AND PROTECTION

- A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

END OF SECTION 08 81 00

SECTION 09 21 16.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes gypsum board shaft wall assemblies.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each component of gypsum board shaft wall assembly.
 - 1. Studs and tracks.
- B. As-Specified Data: If the product to be incorporated into Project is as specified by manufacturer name and product designation in Part 2 of this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below, otherwise submit full Product Data for the following:
 - 1. Gypsum shaftliner board.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and support them on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with gypsum-shaftliner-board manufacturer's written instructions.
- B. Do not install finish panels until installation areas are enclosed and conditioned.

- C. Do not install panels that are wet, moisture damaged, or mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and 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 PERFORMANCE REQUIREMENTS

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.

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

- A. Fire-Resistance Rating: As indicated.
- B. Gypsum Shaftliner Board:
 - 1. Moisture- and Mold-Resistant Type X: ASTM C 1396/C 1396M; manufacturer's proprietary fire-resistive liner panels with ASTM D 3273 mold-resistance score of 10 as rated according to ASTM D 3274, 1 inch thick, and with double beveled long edges.
 - a. <u>Products</u>: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) CertainTeed Corporation; M2 Tech Shaftliner.
 - National Gypsum Company; Gold Bond Brand Fire-Shield Shaftliner XP Gypsum Panels.
 - 3) <u>USG Corporation</u>; Sheetrock Brand Mold Tough Gypsum Liner Panels.
- C. Non-Load-Bearing Steel Framing, General: Complying with ASTM C 645 requirements for metal unless otherwise indicated and complying with requirements for fire-resistance-rated assembly indicated.
 - 1. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.
- D. Studs: Manufacturer's standard profile for repetitive, corner, and end members as follows:
 - 1. Depth: As indicated.
 - 2. Minimum Base-Metal Thickness: 0.033 inch.

- E. Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches long and matching studs in depth.
 - 1. Minimum Base-Metal Thickness: 0.033 inch.
- F. Finish Panels: Gypsum board as specified in Division 09 Section "Gypsum Board.".
- G. Sound Attenuation Blankets: As specified in Division 09 Section "Gypsum Board."

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with shaft wall manufacturer's written instructions.
- B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Division 09 Section "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written instructions for application indicated.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
- D. Track 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. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.
 - 2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- E. Reinforcing: Galvanized-steel reinforcing strips with 0.0538 inch minimum thickness of base metal (uncoated).
- F. Acoustical Sealant: Division 07 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated and manufacturer's written installation instructions.
- B. 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, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.
 - 1. Reinforcing: Provide where items attach directly to shaft wall assembly as indicated on Drawings; accurately position and secure behind at least one layer of face panel.
- C. Penetrations: 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 and similar items.
- D. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels while maintaining continuity of fire-rated construction.
- E. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect while maintaining fire-resistance rating of gypsum board shaft wall assemblies.
- F. 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.
- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.3 PRE-ENCLOSURE REVIEW

A. Notify Architect prior to applying panels to allow observation of framing installation.

3.4 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 mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and 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 09 21 16.23

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Non-load-bearing steel framing systems for interior partitions.
- 2. Suspension systems for interior ceilings and soffits.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Studs and tracks.
 - 2. Slip-type head joints.
 - 3. Flat strap and backing plate.
 - 4. Cold-rolled channel bridging.
 - 5. Hat-shaped, rigid furring channels.
 - 6. Hanger attachments to concrete.
 - 7. Flat hangers.
 - 8. Isolation strips at exterior walls.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

1.6 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, or the Steel Stud Manufacturers Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.
- B. Studs and Tracks: ASTM C 645.
 - 1. Steel Studs and Tracks:
 - a. Minimum Base-Metal Thickness: 0.0329 inch.
 - b. Depth: As indicated on Drawings.
 - c. Minimum Track Leg Length: 1-1/4 inches.
- C. Slip-Type Head Joints: Where indicated, provide the following:
 - 1. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; with minimum track leg length of 2 inches; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 0.0538 inch.
- E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-metal 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.
- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Depth: 7/8 inch.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Power-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by an independent testing agency.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), nonperforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

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.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings. Continue framing around ducts that penetrate 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 door frames; install track section (for cripple studs) at head and secure to jamb studs for opening widths less than 4 feet; install two tracks and stud head member for opening widths 4 feet and wider.
 - 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.
 - 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.

E. Direct Furring:

- 1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING CEILING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- 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. 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.

3.6 PRE-ENCLOSURE REVIEW

A. Notify Architect prior to installing enclosing construction to allow observation of non-structural metal framing installation, including supplementary framing and blocking.

END OF SECTION 09 22 16

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Tile backing panels.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Interior trim.
 - 2. Joint treatment materials.
 - 3. Sound-attenuation blankets.
- B. As-Specified Data: If the product to be incorporated into Project is a specified by manufacturer name and product designation in Part 2 of this Specification Section, submit "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below; otherwise submit full Product Data for the following:
 - 1. Gypsum board, Type X.
 - 2. Mold-resistant gypsum board.
 - 3. Glass-mat, water-resistant backing board.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and 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 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C1396/C1396M.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Gypsum, Saint-Gobain; Type X Gypsum Board.
 - b. National Gypsum Company; Gold Bond Brand Fire-Shield Gypsum Board.
 - c. USG Corporation; Sheetrock Brand Firecode X Panels.
 - 2. Thickness: 5/8 inch.
 - 3. Long Edges: Tapered.
- B. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. CertainTeed Gypsum, Saint-Gobain; M2Tech Moisture and Mold Resistant Gypsum Board Type X.
- b. National Gypsum Company; Gold Bond Brand XP Fire-Shield Gypsum Board.
- c. USG Corporation; Sheetrock Brand Mold Tough Panels Firecode X.
- 2. Core: 5/8 inch, Type X.
- 3. Long Edges: Tapered.
- 4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.4 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C1178/C1178M, with manufactuire's standard edges.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Gypsum, Saint-Gobain; GlasRoc Diamondback Tile Backer Type X.
 - b. National Gypsum Company; Gold Bond Brand eXP Tile Backer Fire-Shield Gypsum Board.
 - c. USG Corporation; Durock Brand Glass-Mat Tile Backerboard (UL Type SGX).
 - 2. Thickness: 5/8 inch, Type X.
 - 3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 - 2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. Expansion (control) joint.

2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.

- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints 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 drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- D. Joint Compound for Tile Backing Panels:
 - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

2.7 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- C. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- D. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- 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.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PRE-ENCLOSURE REVIEW

A. Notify Architect prior to applying panels to allow observation of framing installation, including supplementary framing and blocking.

3.3 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C840.
- 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. 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.
- I. Stud Partition Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.4 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: All surfaces unless otherwise indicated.
 - 2. Mold-Resistant Type: As indicated on Drawings.

B. 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 vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
- 3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.5 APPLYING TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4-inch gap where panels abut other construction or penetrations.

3.6 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 C840 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. L-Bead: Use where indicated.

3.7 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 and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
- E. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.8 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Restore surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and 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.

END OF SECTION 09 29 00

SECTION 09 30 13 - CERAMIC TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Ceramic tile.
 - 2. Metal edge strips/base.

1.3 DEFINITIONS

- A. General: Definitions in the current ANSI A108 A118, series of tile installation standards and in the current ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ISO 13007; Standards for Ceramic Tiles, Grouts and Adhesives.

1.4 PERFORMANCE REQUIREMENTS

- A. Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per the DCOF AcuTest in accordance with ANSI A137.1 2012 standard.
 - 1. Level Surfaces: Minimum 0.42 wet.

1.5 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Glazed wall tile: CWT1.
 - 2. Latex-portland cement mortar (thin set).
 - 3. Water-cleanable epoxy grout.
 - 4. Metal edge strips.

- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
 - 1. Show base details.
- C. Samples for Verification and Initial Color Selection:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.
 - 3. Metal edge strips/base in 6-inch lengths.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- C. Product Certificates: For each type of product, signed by product manufacturer.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- 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. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.9 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one 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 from a single manufacturer for each product:
 - 1. Metal edge strips/base.

1.10 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 requirements in current ANSI A137.1 for labeling 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 can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.11 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.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with most current ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with most current 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.
- C. ISO 13007 Standards for Ceramic Tiles, Grouts and Adhesives: Provide materials complying with ISO 13007-1, 13007-2, 13007-3, 13007-4.
- D. Factory Blending: For tile exhibiting color variations within ranges, 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.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

2.2 TILE PRODUCTS

- A. Tile Type CWT 1: Glazed Wall Tile
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Daltile "Linear- color wheel collection Glazed ceramic tile"; Division of Dal-Tile International Inc.; Matte and Semi-Gloss or comparable product by one of the following:
 - a. American Olean Inc.
 - 2. Module Size: 4 x 8 inches.
 - 3. Thickness: 5/16 inch.
 - 4. Face: Plain with cushion edges.
 - 5. Finish: Matte Semi-gloss glaze.
 - 6. Tile Color and Pattern: As selected by Architect, as follows:
 - a. Field Tile: Daltile Matte and Semi-Gloss, price groups 1 and 2.
 - b. Accent Tile: Daltile Matte and Semi-Gloss, all price groups including price group 4 made-to-order.
 - c. Provide accent tile equal to 30 percent of total tile area, with the remainder as field tile.
 - 7. Grout Color: As selected by Architect from manufacturer's full range.
 - 8. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. External Corners for Thin-Set Mortar Installations: Surface bullnose, same size as adjoining flat tile.
 - b. Internal Corners: Field-butted square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.

2.3 SETTING MATERIALS

- A. Latex-Portland Cement Mortar (Thin Set): ISO 13007; C2ES2P2 and ANSI A118.4.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Laticrete International; Laticrete 254 platinum or comparable product by one of the following:
 - a. MAPEI- Ultra Flex 3
 - b. TEC; a subsidiary of H. B. Fuller Company.
 - c. Custom Building Products
 - 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.

3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

2.4 GROUT MATERIALS

- A. Water-Cleanable Epoxy Grout: ISO 13007; RG and ANSI A118.3.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Laticrete International; Spectralock Pro Premium Epoxy Grout or comparable product by one of the following:
 - a. MAPEI-Kerapoxy CQ
 - b. TEC; a subsidiary of H. B. Fuller Company.
 - c. Custom Building Products

2.5 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
- C. Metal Base: height to match tile, metal-designed specifically for wall applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
 - 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. Schluter Systems L. P.

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 installed tile.
 - 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 current ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors installed with thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. 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.
 - 4. 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.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile installed with suitable products made to be trowelable with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with current ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, 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 TILE INSTALLATION

- A. Comply with current TCNA's "Handbook for Ceramic Tile Installation" for current TCNA installation methods specified in tile installation schedules. Comply with parts of the current ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in current TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the current ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
 - Tile floors in wet areas.
- B. 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.
- C. 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. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. 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.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
 - 4. Grout coverage for tile mounted sheets must have a minimum of 2/3, verify in field prior to installation that tile tabs are no more than 1/3 of the tile height.
- F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - 1. Glazed Wall Tile: 1/16 inch.
- G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- H. Metal Edge Strips: Install at locations indicated where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

3.4 WATERPROOFING INSTALLATION

- A. Install ANSI A118.10 waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.5 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove epoxy 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 and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. 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.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.6 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Wall Installations:
 - 1. Tile Installation W202-11: Thin-set mortar; TCNA W202, ANSI A108.1A
 - a. Tile Type: CWT.
 - b. Thin-Set Mortar: Latex-portland cement mortar.
 - c. Grout: Water-cleanable epoxy grout.

END OF SECTION 09 30 13

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.3 DEFINITIONS

- A. CAC: Ceiling Attenuation Class.
- B. LR: Light Reflectance.
- C. NRC: Noise Reduction Coefficient.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTALS, GENERAL

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Attachment devices.
 - 2. Wire hangers, braces and ties.
 - 3. Hanger rods.
 - 4. Flat hangers.
 - 5. Angle hangers.
 - 6. Hold-down clips.
 - 7. Roll-formed, sheet-metal edge moldings and trim.
- B. As-Specified Data: If the product to be incorporated into Project is as specified by manufacturer name and product designation in Part 2 of this Specification Section, submit the "As-Specified Verification Form" (attached to Division 01 Section "Submittal Procedures") for each item listed below; otherwise submit full Product Data for the following:

- 1. Acoustical panels for ceiling type A2.
- 2. Metal suspension system for ceiling type A2.
- 3. Extruded-aluminum or roll-formed, steel sheet metal edge moldings and trim.
- C. Samples for Verification: If proposing products other than those specifically named in Part 2 of this Section, for each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
 - 1. Acoustical Panels: Set of 6-inch-square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch-long Samples of each type, finish, and color.

1.7 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension-system members.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Method of attaching hangers to building structure.
 - 4. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Lighting fixtures.
 - b. Diffusers.
 - c. Grilles.
 - d. Speakers.
 - e. Sprinklers.
 - f. Access panels.
 - g. Detectors.
 - h. Exit signs.
 - i. Sensors.
 - j. Cameras.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed of each acoustical panel type.

- 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed of each metal suspension system type.
- 3. Hold-Down Clips: Equal to 2 percent of quantity installed.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site 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.

1.11 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Match each type of acoustical ceiling panel with a supporting suspension system of the same manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Class A according to ASTM E1264.
 - 2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- B. Color: White.

C. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273, ASTM D3274, or ASTM G21 and evaluated according to ASTM D3274 or ASTM G21.

2.4 STANDARD ACOUSTICAL PANELS FOR WIDE-FACE SUSPENSION SYSTEMS

- A. Acoustical Panels for Ceiling Type A2:
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to:
 - a. Armstrong World Industries, Inc.; Tundra 301.
 - b. CertainTeed Ceilings; School Board FFSB-157.
 - c. USG Corporation; Touchstone Panels 5893.
 - 2. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
 - 3. Pattern: As indicated by manufacturer's designation.
 - 4. Modular Size: 24 by 24 inches.
 - 5. Thickness: 5/8 inch.
 - 6. Edge Detail: Square.
 - 7. NRC: Not less than 0.50.
 - 8. CAC: Not less than 30.
 - 9. LR: Not less than 0.80.

2.5 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C635/C635M and designated by type, structural classification, and finish indicated.

2.6 WIDE-FACE METAL SUSPENSION SYSTEMS

- A. Wide-Face Suspension System for Ceiling Type A2:
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong World Industries, Inc.; Prelude XL 15/16-inch Exposed Tee System.
 - b. CertainTeed Ceilings; 15/16-inch EZ Stab Classic System.
 - c. USG Corporation; Donn Brand DX Acoustical Suspension System.

- 2. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch-wide metal caps on flanges.
- 3. Structural Classification: Heavy-duty system.
- 4. End Condition of Cross Runners: Override (stepped) type.
- 5. Face Design: Flat, flush.
- 6. Cap Material: Cold-rolled steel.
- 7. Cap Finish: Painted white.

2.7 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. 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 according to ASTM E1190, conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
 - 2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch-diameter wire.
- C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.
- F. Hold-Down Clips: Manufacturer's standard hold-down.

2.8 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 comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

- 1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
- 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- B. Extruded-Aluminum or Roll-Formed Steel Sheet-Metal Edge Moldings and Trim: Where indicated for ceiling clouds or fasciae, provide manufacturer's extruded-aluminum or roll-formed steel sheet-metal edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong World Industries, Inc.; Axiom Classic Trim.
 - b. USG Corporation; Compasso Suspension Trim.
 - 2. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils. Comply with ASTM C635/C635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.9 ACOUSTICAL SEALANT

A. Acoustical Sealant: As specified in Division 07 Section " Joint 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. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

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 unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Lay out openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C636/C636M and manufacturer's written instructions.
- 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.
 - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure 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. Secure flat, angle, channel, and rod hangers to structure by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 - 6. 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.
 - 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - 8. Do not attach hangers to steel deck tabs.
 - 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 - 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical 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. Miter corners accurately and connect securely.
 - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. 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 precise fit
 - 1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 - 2. Install hold-down clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.
 - a. Hold-Down Clips: Space 24 inches o.c. on all cross runners.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Periodic inspection during the installation of suspended ceiling grids according to ASCE/SEI 7.
- B. Acoustical panel ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.

3.5 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.
- B. Remove and replace ceiling components that cannot be successfully cleaned and restored to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient molding accessories.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Resilient base: rubber RB.
 - 2. Reducers.
 - 3. Edge guards.
 - 4. Adapters.
 - 5. Nosing for carpet
 - 6. Nosing for resilient floor coverings.
 - 7. Trowelable leveling and patching compounds.
 - 8. Concrete slab primer.
 - 9. Adhesives.

B. Samples for Verification and Initial Color Selection:

1. For each type of product indicated, in manufacturer's standard-size Samples but not less than 2-1/2 inches long, of each resilient product color, texture, and pattern required.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Resilient Base and Accessories: Obtain each type of resilient base and accessories from a single source with resources to provide materials of consistent quality in appearance and physical properties.
- B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.7 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 55 deg F or more than 90 deg F.

1.8 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 90 deg F, in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 90 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE: RUBBER RB

A. Resilient Base:

- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
 - a. Mannington Commercial; Premium Rubber Edge.
 - b. Johnsonite; Rubber Wall Base.
 - c. Roppe Corporation, USA; Pinnacle Series Rubber Wall Base

- B. Resilient Base Standard: ASTM F 1861.
 - 1. Material Requirement: Type TP (rubber, thermoplastic).
 - 2. Manufacturing Method: Group I (solid, homogeneous).
 - 3. Style: Cove (base with toe).
- C. Minimum Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length, not less than 100 feet.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 RESILIENT MOLDING ACCESSORY

- A. Resilient Molding Accessory:
 - 1. <u>Products</u>: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Reducer:
 - 1) Johnsonite; RR-XX Series Reducers.
 - 2) Roppe Corporation, USA; Reducer 1/8 inch.
 - b. Edge Guards:
 - 1) Johnsonite; EG-XX Series Edge Guard.
 - 2) Roppe Corporation, USA; Carpet Edge 1/4-inch.
 - c. Adapters:
 - 1) Johnsonite; CTA-XX Series Adapter.
 - 2) Roppe Corporation, USA; Tile and Carpet Joiner.
 - d. Stair accessories
 - 1) Johnsonite, VITSN-XX
- B. Material: Vinyl or rubber.
- C. Profile and Dimensions: As indicated.
- D. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
 - 1. Basis-of-Design Products: Subject to compliance with requirements, provide the following Ardex product or a comparable product:
 - a. Portland Cement-Based Flash Patching and Skim Coating: SD-F Feather Finish.
 - b. Portland Cement-Based Patching: SD-P Insta Patch.
 - c. Portland Cement-Based Self-Leveling Underlayment: K-10/K-60 Self-Leveling Underlayment Concrete.
- B. Concrete Slab Primer: Non-staining type recommended by resilient accessories manufacturer.
- C. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesives 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."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

- B. Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. 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.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass 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.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.

- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Job-Formed Corners- using manufactures approved methods and tools:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible. Use scribing and cutting measures approved by base manufacturer. Inside corners that are not scribed to fit will be rejected.
 - 3. Use Crane #532 top-set gouger tool for all required for tight wrap and curved corners.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet and resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. 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.
 - 4. Do not wash floor until after the period recommended by manufacturer.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products until Substantial Completion.

END OF SECTION 09 65 13

SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Luxury vinyl floor tile.
 - 2. Vinyl composition floor tile.
 - 3. Movement joint.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Luxury-vinyl floor tile LVT.
 - 2. Vinyl composition floor tile VCT1.
 - 3. Trowelable leveling and patching compounds.
 - 4. Concrete slab primer.
 - 5. Adhesives.
 - 6. Movement Joint
 - 7. Floor polish.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of patterns.
 - 2. Show base details.
 - 3. Show locations of divider strips, control and expansion joints.
 - 4. Show locations of floor drains and sloped slabs.
 - 5. Show threshold locations and types.
- C. Samples for Verification and Initial Color Selection: Full-size units of each color and pattern of floor tile required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.7 MATERIALS MAINTENANCE SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.
- B. Source Limitations for Resilient Tile: Obtain each type of resilient tile from a single source with resources to provide materials of consistent quality in appearance and physical properties.
- C. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 55 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.10 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 90 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. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 90 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Low-Emitting Materials: Flooring 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 LUXURY VINYL FLOOR TILE -LVT

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Tarkett Luxury Vinyl Tile "iD Latitude Series- planks and tiles including Woods, Stone Concrete, Stria Marble, Fineline Texgrains Colorgrain, Standard Emboss and Standard Edge"
- B. Tile Standard: ASTM F 1700.
 - 1. Class: III.
 - 2. Type: Type B.
 - 3. ASTEM E648-06 Class 1
- C. Thickness: 0.120 (3.0mm) with 20 mil wear layers.
- D. Size: varies per series.
- E. Colors and Patterns: As selected by Architect from full range of industry colors and iD series as described above.

2.3 VINYL COMPOSITION FLOOR TILE: VCT1

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Field Tile:

- a. Armstrong World Industries, Inc.; Standard Excelon Imperial Texture (including Imperial Texture Classics) and Standard Excelon MultiColor.
- b. Johnsonite Flooring the Azrock collection, (including standard, textile and solids collections).

2. Accent Tile 30%:

- a. Armstrong World Industries, Inc.; Standard Excelon Imperial Texture (including Imperial Texture Classics), Standard Excelon MultiColor, and Standard Excelon Rave.
- b. Johnsonite Flooring the Azrock collection, (including standard, textile and solids collections).
- B. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch, 1/8inch.
- E. Size: 12 by 12 inches.
- F. Colors and Patterns: As selected by Architect from full range of industry colors.
 - 1. Provide accent tile equal to 30 percent of total vinyl composition floor tile area, with the remainder as field tile.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
 - 1. Basis-of-Design Products: Subject to compliance with requirements, provide the following Ardex product or a comparable product:
 - a. Portland Cement-Based Flash Patching and Skim Coating: SD-F Feather Finish.
 - b. Portland Cement-Based Self-Leveling Underlayment: K-10/K60 Self-Leveling Underlayment Concrete.
- B. Concrete Slab Primer: Non-staining type recommended by resilient tile flooring manufacturer.
- C. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.

- 1. Adhesives shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. VCT Adhesives: Not more than 50 g/L.
- 2. Adhesives 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."
- D. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer, containing not less than 16 to 25 percent solids.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. 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 floor tile.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions 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. 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.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass 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.
 - 1) At a minimum, test concrete substrates in at least 3 locations in separate parts of the floor for applications of 2000 square feet or less; provide one additional test location for each additional 1000 square feet, or fraction thereof.
- b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.

C. Wood Subfloors:

- 1. Verify that underlayment over subfloor complies with requirements in Section 06 16 00, "Sheathing."
- 2. Verify underlayment surface is free of surface irregularities and substances with potential to interfere with adhesive bond, show through surface, or stain tile.
- D. Existing Floors: Condition of existing subfloor is unknown prior to removal of existing flooring. If, after removal of existing flooring, subfloor requires leveling, patching, or filling, notify Architect in writing.
 - 1. Asbestos Abatement Areas: In areas where removal of existing flooring is included in asbestos abatement procedures, coordinate with entity responsible for abatement to ensure patching and repair is compatible with requirements for installation of resilient tile flooring.
- E. Comply with resilient tile manufacturer's written instructions to prepare substrates.
 - 1. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
 - 2. Ensure patching and repair materials are compatible with resilient tile.
 - 3. Levelness Tolerances: Apply patching and repair materials to provide levelness of floor substrate within 1/4 inch in 10 feet, unless more stringent levelness is recommended or required by resilient tile manufacturer.
 - 4. Flash Patching and Skim Coating: Apply flash patching material to areas with 1/8 inch or less depression.
 - 5. Patching: Apply patching material to areas with 1/8 inch or greater depression.
 - 6. Self-Leveling Underlayment: Apply self-leveling material to areas where flash patching and patching described above cannot provide smooth, level surface acceptable to receive resilient tile flooring.

- F. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- G. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor 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.
- C. Match floor 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.
 - 1. Lay tiles as follows: 12" x 12"- VCT existing.
 - a. Field Tile: To match existing.
 - b. Accent Tile: To match existing.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. 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, non-staining marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Apply concrete slab primer, if recommended by resilient tile manufacturer, prior to applying adhesive. Apply according to manufacturer's written instructions.
- I. Adhere floor 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 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Perform the following operations immediately after completing floor tile 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.
 - 4. Do not wash floor until after the period recommended by resilient tile manufacturer.
- C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish- VCT: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.
- E. Cover floor tile until Substantial Completion.
- F. Perform the following operations in each area of Project upon completion of floor installation and as recommended by manufacturer.
 - 1. Vinyl Composition Floor Tile:
 - a. Scrub floor with a neutral detergent solution at 4 to 6 oz per gallon. Scrub floor using pads or brushes as recommended by vinyl composition floor tile manufacturer.
 - b. Use stripping solutions at badly soiled or scratched areas, as recommended by vinyl composition floor tile manufacturer.
 - c. Thoroughly rinse floor, wet vacuum and dry floor. Floor must be free from all dust, dirt and any particles that may become lodged in final polish application.
 - d. Apply five coats of commercial floor polish. Apply each coat as recommended by product manufacturer.

END OF SECTION 09 65 19

SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Carpet tile.
- B. Entry way carpet tile system.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate.
 - 1. Carpet tile.
 - 2. Entry way carpet tile
 - 3. Trowelable leveling and patching compounds.
 - 4. Adhesives.
 - 5. Metal edge/transition strip.
- 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. Pattern type, repeat size, location, direction, and starting point.
 - 4. Type, color, and location of edge, transition, and other accessory strips.
 - 5. Transition details to other flooring materials.
- C. Samples for Verification and Initial Color Selection: 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. Sample Warranty: For special warranty.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet tile, 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 tile.
- B. Warranty: Executed special warranty.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- 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 Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.
- B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.
- C. Floor Radiant Panel Test: Flooring material meets the ASTM E -648 Radiant Panel Test, Class 1 requirements.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.10 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.11 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE C1

- A. Basis of design product: Subject to compliance with requirements, provide, "Streaming Collection by Interface" or by the following:
 - 1. Or approved equal.
- B. Pattern: Streaming Collection "Bitrate and Upload"
- C. Color: As selected by Architect from manufacturer's full range.
- D. Fiber Content: 100 Percent Recycled Content Nylon.
- E. Fiber Type: 100 Percent Solution Dyed.
- F. Pile Characteristic: Tufted Pattern Loop
- G. Pile Thickness: 0.086 in., 2.2 mm.
- H. Total Recycled Content: 75 percent.
- I. Primary Backing/Backcoating: GlasBac Tile.
- J. Plank Size: 23cm x 1m.

- K. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- L. Antimicrobial Treatment: Manufacturer's standard material.
- M. Performance Characteristics: As follows:
 - 1. Appearance Retention Rating: Heavy traffic, 3.0 minimum according to ASTM D 7330.
 - 2. Critical Radiant Flux Classification: Not less than Class A-0.45 W/sq. cm]2 W/sq. cm.
 - 3. Electrostatic Propensity: Less than 3.0 kV according to AATCC 134.
 - 4. Emissions: Provide carpet tile that complies with testing and product requirements of CRI's "Green Label Plus" program.
 - 5. Emissions: Provide carpet tile that complies with the 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 ENTRY WAY CARPET TILE C3

- A. Basis of design product: Subject to compliance with requirements, provide, "Mannington Commercial Carpet." Collection: Iiaison Collection Carpet Entry System" the following Pattern or comparable product by the following:
 - 1. Mannington Commercial; Liaison collection.
- B. Pattern: Recoarse II, Ruffian II, Take Back, Traverse, Trek,
- C. Color: As selected by Architect from manufacturer's full range.
- D. Fiber Content: 100 percent nylon 6, 6.
- E. Pile Characteristic: Tip Shear Tufted loop pile
- F. Pile Thickness: 0.155 for inches.
- G. Stitches: 9 per inch.
- H. Gage: 5/32.
- I. Face Weight: 26 oz/sq. yd.
- J. Primary Backing/Backcoating: 100% Synthetic.
- K. Secondary Backing:
 - 1. Mannington: Infinity RE Modular.
- L. Size: 24 by 24 inches. (50 x 50 cm)

- M. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- N. Performance Characteristics: As follows:
 - 1. Appearance Retention Rating: Heavy traffic, 3.0 minimum according to ASTM D 7330.
 - 2. Electrostatic Propensity: Less than 3.0 kV according to AATCC 134.
 - 3. Emissions: Provide carpet tile that complies with testing and product requirements of CRI's "Green Label Plus" program.
 - 4. Emissions: Provide carpet tile that complies with the 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."

2.3 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
 - 1. Basis-of-Design Products: Subject to compliance with requirements, provide the following Ardex product or a comparable product:
 - a. Portland Cement-Based Flash Patching and Skim Coating: Feather Finish.
 - b. Portland Cement-Based Patching: SD-P.
 - c. Portland Cement-Based Self-Leveling Underlayment: K-10/K-60 Self-Leveling Underlayment Concrete.
 - B. Adhesives: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesives 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. Metal Edge/Transition Strips: Extruded aluminum with finish selected by Architect, of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

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 tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: 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 carpet tile manufacturer.
 - 2. Subfloor finishes comply with requirements specified in Section 03 30 00 "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 4. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 5. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass 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.
 - 1) At a minimum, test concrete substrates in at least 3 locations in separate parts of the floor for applications of 2000 square feet or less; provide one additional test location for each additional 1000 square feet, or fraction thereof.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.
- C. For wood subfloors, verify the following:
 - 1. Underlayment over subfloor complies with requirements specified in Section 06 10 00 "Rough Carpentry."
 - 2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.

- D. Existing Floors: Condition of existing subfloor is unknown prior to removal of existing flooring. If, after removal of existing flooring, subfloor requires leveling, patching, or filling, notify Architect in writing.
 - 1. Asbestos Abatement Areas: In areas where removal of existing flooring is included in asbestos abatement procedures, coordinate with entity responsible for abatement to ensure patching and repair is compatible with requirements for installation of carpet.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
- F. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
 - 1. Ensure patching and repair materials are compatible with carpet tile.
 - 2. Levelness Tolerances: Apply patching and repair materials to provide levelness of floor substrate within 1/4 inch in 10 feet, unless more stringent levelness is recommended or required by carpet tile manufacturer.
 - 3. Flash Patching and Skim Coating: Apply flash patching material to areas with 1/8 inch or less depression.
 - 4. Patching: Apply patching material to areas with 1/8 inch or greater depression.
 - 5. Self-Leveling Underlayment: Apply self-leveling material to areas where flash patching and patching described above cannot provide smooth, level surface acceptable to receive carpet tile.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

A. Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.

- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Maintain dye lot integrity. Do not mix dye lots in same area.
- D. Cut and fit carpet tile 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 tile manufacturer.
- E. Extend carpet tile 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.
- G. Install pattern parallel to walls and borders.
- H. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."
- C. Protect carpet tile 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 tile manufacturer.

END OF SECTION 09 68 13

SECTION 09 72 00 - WALL COVERINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Projection/Marker Board Wall Covering.
 - 2. Tackable wall covering

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include data on physical characteristics, durability, fade resistance, and flame-resistance characteristics.
- B. Shop Drawings: Show location and extent of each wall-covering type. Indicate seams and termination points.
- C. Samples for Verification and Initial Color Selection: Full width by 36-inch-long section of wall covering and molding samples not less than 12 inches long.
 - 1. Sample from same print run or dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of fabric.
 - 2. Sample from same flitch to be used for the Work, with specified finish applied.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for wall covering.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For wall coverings to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Wall-Covering Materials: For each type, full-size units equal to 10 percent of amount installed, but not less than one full roll.

1.8 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Surface-Burning Characteristics: As follows, per ASTM E 84:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 2. Fire-Growth Contribution: Textile wall coverings tested according to NFPA 265- non sprinklered area, on partitions of 8 feet or above, NFPA 286 non sprinklered area on partitions less than 8 feet and complying with test protocol and criteria in the 2003 IBC.
- B. 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 type of wall covering on each substrate required. Comply with requirements in ASTM F 1141.
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weather tight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 1. Maintain a consistent temperature of not less than 60 deg F in installation areas for at least 10 days before and 10 days after installation, unless otherwise recommended by wall covering manufacturer.
 - 2. Wood-Veneer Wall Coverings: Condition spaces for not less than 48 hours before installation.
- B. Lighting: Do not install wall covering until a permanent level of lighting is provided on the surfaces to receive wall covering.
- C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Low-Emitting Materials: Wall covering 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 WALL COVERINGS

A. General: Provide rolls of each type of wall covering from same print run or dye lot.

2.3 PROJECTION/MARKER BOARD WALL COVERING

- A. Vinyl, gloss, smooth wallcovering for projection and dry erase markers:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Wall talker "Matte-rite"; or comparable product.
- B. Pattern: Visual textured- smooth, high gloss
- C. Total thickness: 17 mils.
- D. Width: 60" inches.
- E. Backing: Non-woven on gyp board.
- F. Adhesive: heavy duty clear or clay based premixed vinyl adhesive as recommended by manufacture.
- G. Substrate primer: White pigmented acrylic base primer/sealer specifically formulated to use with vinyl wallcovering.
- H. Substrate surface: Minimum Level 4 finish, per GA-214-M-97.
- I. Colors, Textures, and Patterns: As selected by Architect from manufacturer's full range.

2.4 TACKABLE WALLCOVERING

- A. Linoleum resilient homogeneous, self-healing tackable wall surface:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Wall talker "Tac-wall"; or comparable product.
- B. Pattern: C250
- C. Total thickness: ½ inch.

- D. Width: 47"/48".
- E. Backing: Burlap.
- F. Adhesive: Solvent-free, SBR type linoleum adhesive (L-910) as recommended by manufacture.
- G. Substrate primer: White pigmented acrylic base primer/sealer specifically formulated to use with vinyl wallcovering.
- H. Substrate surface: Minimum Level 4 finish, per GA-214-M-97.
- I. Colors, Textures, and Patterns: As selected by Architect from manufacturer's full range, of min. 12 colors

2.5 ACCESSORIES

- A. Adhesive: Mildew-resistant, non-staining, strippable adhesive, for use with specific wall covering and substrate application; as recommended in writing by wall-covering manufacturer.
 - 1. Adhesive shall have VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive 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. Primer/Sealer: Mildew resistant, complying with requirements in Section 09 90 00 "Painting" and recommended in writing by wall-covering manufacturer for intended substrate.
- C. Wall Liner: Nonwoven, synthetic underlayment and adhesive as recommended by wall-covering manufacturer.
- D. Seam Tape: As recommended in writing by wall-covering manufacturer.
- E. Metal Primer: Interior ferrous metal primer complying with Section 09 90 00 "Painting."
- F. Marker/Eraser Dispenser- Provide Plastic marker/eraser dispenser for each board unit, min. one per room.
- G. Trim:
 - 1. Wall-covering for projection and dry erase markers: J-cap, 1/16" aluminum trim, miter at all corners. Secure with mechanical fasteners with self-tapping drywall screws.
 - 2. Wallcovering for tackable surface: J-trim, 5/16 aluminum trim, miter at all corners. Secure with mechanical fasteners with self-tapping drywall screws.
 - 3. Wall covering for tackable surface: H-trim, 5/16 aluminum trim, for material seams. Secure with mechanical fasteners with self-tapping drywall screws.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumpness, maximum moisture content, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, mildew, and incompatible primers.
- C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
 - 1. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
 - 2. Plaster: Allow new plaster to cure. Neutralize areas of high alkalinity. Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
 - 3. Metals: If not factory primed, clean and apply metal as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
 - 4. Gypsum Board: Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
 - 5. Painted Surfaces: Treat areas susceptible to pigment bleeding.
- D. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finish with fine sandpaper.
- E. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.
- F. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.
- G. Install wall liner, with no gaps or overlaps, where required by wall-covering manufacturer. Form smooth wrinkle-free surface for finished installation. Do not begin wall-covering installation until wall liner has dried.

3.3 INSTALLATION

- A. General: Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated except where more stringent requirements apply.
- B. Cut wall-covering strips in roll number sequence. Change roll numbers at partition breaks and corners.
- C. Install strips in same order as cut from roll.
- D. Install reversing every other strip.
- E. Install wall covering with no gaps or overlaps, no lifted or curling edges, and no visible shrinkage.
- F. Match pattern 72 inches above the finish floor.
- G. Install seams vertical and plumb at least 6 inches from outside corners and 3 inches from inside corners unless a change of pattern or color exists at corner. No horizontal seams are permitted.
- H. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.
- I. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without any overlay or spacing between strips.

3.4 CLEANING

- A. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces.
- B. Use cleaning methods recommended in writing by wall-covering manufacturer.
- C. Replace strips that cannot be cleaned.
- D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION 09 72 00

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and application of paint systems, for the following:
 - 1. Interior applications.
 - a. Painting systems indicated on Drawings and in Schedules applied to new and existing exterior and interior surfaces and related components including but not limited to items such as hollow metal doors frames, doors, access doors, trim pieces, window sash, trim and previously painted cabinet heater/fin tube enclosures, etc., unless otherwise indicated, including appropriate surface preparation for all new or existing surfaces to be painted including previously painted surfaces and surfaces with existing wall coverings

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product for substrates indicated. Include preparation requirements and application instructions. Include all paint products under one cover sheet.
 - 1. Interior concrete, vertical surfaces.
 - 2. Interior concrete, vertical surfaces (deep tone accent colors).
 - 3. Interior CMU.
 - 4. Interior CMU (deep tone accent colors).
 - 5. Interior steel.
 - 6. Interior steel (deep tone accent colors).
 - 7. Interior previously painted cabinet heater/fin tube enclosures.
 - 8. Interior steel piping, piping supports and hangers.
 - 9. Interior galvanized-metal.
 - 10. Interior galvanized-metal (metal deck).
 - 11. Interior galvanized metal (metal deck, deep tone accent colors).
 - 12. Interior aluminum (where indicated).
 - 13. Interior wood.

- 14. Interior wood (deep tone accent colors).
- 15. Interior hardboard (stage floor).
- 16. Interior fiberglass reinforced polyester (FRP).
- 17. Interior plaster.
- 18. Interior plaster (deep tone accent colors).
- 19. Interior gypsum board.
- 20. Interior gypsum board (deep tone accent colors).
- 21. Interior insulation-covering.
- 22. Interior insulation-covering (deep tone accent colors).
- 23. Textured plaster.
- 24. Interior stained wood (closed or open grain).
- 25. Interior stained wood (closed or open grain).
- 26. Interior clear finish wood (closed grain).
- 27. Interior clear finish wood (closed grain).
- B. Samples for Verification and Initial Color Selection: For each type of finish system and in each color and gloss of finish indicated.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - a. For wood finishes, submit Samples on representative samples of actual wood substrates, 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated, include the following:
 - 1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. VOC content. Tints and /or colorant shall add no additional VOC to final product. Provide 3rd party certification of VOC content.
- D. Coatings Maintenance Manual:
 - 1. Upon conclusion of the project, the contractor or paint manufacture/supplier shall furnish a coatings maintenance manual such as Sherwin Williams "Custodian Project Color and Product Information" report. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions. Touch up procedures and color samples of each color and finish used. All information contained in a self-bound 3 ring hole punched catalog.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For applicator.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- 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. Paint: 10 percent, but not less than 1 gal. of each material and color applied.
 - 2. Stains and Transparent Finishes: 10 percent, but not less than 1 gal. of each material and color applied.

1.7 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual, experienced in applying finishes specified in this Section, who has successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; familiar with special requirements indicated; and with sufficient trained staff to apply manufacturer's products according to specified requirements.
- B. Mockups: Apply mockups of each finish system indicated to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each finish system specified in Part 3.
 - a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.9 FIELD CONDITIONS

A. Apply finishes only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F.

- B. Do not apply finishes when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior finishes in snow, rain, fog, or mist.
- D. Lighting: Do not install finishes until a lighting level of not less than 80 fc is provided on the surfaces to receive finishing.

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 the following:
 - 1. Benjamin Moore & Co.
 - 2. PPG Architectural Finishes, Inc.
 - 3. Sherwin-Williams Company (The).
- B. Submittals containing manufactures other than stated above, will require a product by product comparison for each type of paint. All Comparable equals are to be matched with corresponding Sherwin Williams specified products.
- C. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in Part 3 articles for the application indicated.

2.2 MATERIALS, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.
 - 3. Provide products of same manufacturer for each coat in a finish system.
- B. VOC Compliance: All paint products shall meet New York requirements for Volatile Organic Compound (VOC) and Ozone Transport Commission (OTC) regulations, January 2005.
- C. Colors: As selected by Architect from manufacturer's full range.
 - 1. 25 percent of surface area will be painted with deep tones.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Concrete: 12 percent.
 - b. Masonry (Clay and CMU): 12 percent.
 - c. Wood: 15 percent.
 - d. Gypsum Board: 12 percent.
 - e. Plaster: 8 percent.
- B. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- C. Plaster Substrates: Verify that plaster is fully cured.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be finished. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- B. Clean substrates of substances that could impair bond of finishes, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce finish systems indicated.
- C. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions.

- E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 3, "Power Tool Cleaning."
 - 2. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- H. Galvanized Metal/Galvanized Deck, Factory Primed Surface-Coordinate with approved paint manufacture on compatibility of paint finish coats to factory prime surface.
- I. Aluminum Substrates: Remove loose surface oxidation.
- J. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer apply coat of knot sealer recommended in writing by topcoat manufacturer for coating system indicated.
 - 2. Apply wood filler paste to open-grain woods to produce smooth, glasslike finish.
 - 3. Sand surfaces that will be exposed to view and dust off.
 - 4. Prime edges, ends, faces, undersides, and back sides of wood.
 - 5. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- K. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.
- L. Alteration Work: Comply with applicable surface preparation requirements specified and as recommended by finish materials manufacturer for existing surfaces to receive paint or other finishes, including cleaning, sanding, and roughening as required for proper adherence of new finish material.
 - 1. Existing Woodwork: Strip existing wood finish to bare wood using commercially available solvents compatible with finish. Use in strict accordance with manufacturer's printed instructions. After stripping operation is complete and surface is dry, sand surface with sandpaper, using random orbital sanding machine.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for finish and substrate indicated.

- 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
- 3. Paint back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- 4. Do not apply paints over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.
- E. Alterations: Finish new surfaces adjacent to unaltered existing surfaces with finish of same type and surface texture as corresponding adjacent surfaces, unless otherwise indicated. Finish patched, damaged, or extended surfaces to match existing surfaces.
- F. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, pipe and insulation having cotton or canvas insulation covering or another paintable jacket material.
 - 2. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or another paintable jacket material.
 - h. Other items as directed by Architect.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Vertical Surfaces:
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Moore's Acrylic Masonry Primer 066.
 - b. PPG Paints: Perma-Crete Alkali-Resistant Primer 4-603.
 - c. Sherwin-Williams Company (The); Loxon Concrete & Masonry Primer (LX02W0050.)
 - 2. Second and Third Coats (Semi-Gloss):
 - a. Benjamin Moore & Co.; N539 Ultra Spec 500 Interior Semi-Gloss.
 - b. PPG Paints: Speedhide Interior Semi-Gloss Latex 6-500.
 - c. Sherwin-Williams Company (The); Pro Mar 200 Zero VOC Interior Latex S/G B31 Series.

- B. Concrete Substrates, Vertical Surfaces (Deep Tone Accent Colors):
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Moore's Acrylic Masonry Primer 066.
 - b. PPG Paints: Perma-Crete Alkali-Resistant Primer 4-603.
 - c. Sherwin-Williams Company (The); Loxon Concrete & Masonry Primer (LX02W0050.)
 - 2. Second and Third Coats (Semi-Gloss): Additional coats may be required.
 - a. Benjamin Moore & Co.; Ultra Spec 500 Interior Semi-Gloss N539.
 - b. PPG Paints: Speedhide Interior Semi-Gloss Latex 6-500.
 - c. Sherwin-Williams Company (The); ProMar 200 Zero VOC S/G B31-2600.

C. CMU Substrates:

- 1. First Coat:
 - a. Benjamin Moore & Co.; Super Spec Masonry Int-Ext Hi-Build Block Filler 571.
 - b. PPG Paints: Speedhide Interior/Exterior Latex Block Filler 6-7.
 - c. Sherwin-Williams Company (The); PrepRite Block Filler B25W25
- 2. Second and Third Coats (Semi-Gloss):
 - a. Benjamin Moore & Co.; N539 Ultra Spec 500 Interior Semi-Gloss.
 - b. PPG Paints: Speedhide Interior Semi-Gloss Latex 6-500.
 - c. Sherwin-Williams Company (The); Pro Mar 200 Zero VOC Interior Latex S/G B31 Series.
- D. CMU Substrates (Deep Tone Accent Colors):
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Super Spec Masonry Int-Ext Hi-Build Block Filler 571.
 - b. PPG Paints: Speedhide Interior/Exterior Latex Block Filler 6-7.
 - c. Sherwin-Williams Company (The); PrepRite Block Filler B25W25.
 - 2. Second and Third Coats (Semi-Gloss): Additional coats may be required.
 - a. Benjamin Moore & Co.; Ultra Spec 500 Interior Semi-Gloss N539.
 - b. PPG Paints: Speedhide Interior Semi-Gloss Latex 6-500.
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Coating S/G (B66-20 DTM Acrylic Coating S/G (B66-W01151 Series) or Gloss (B66-W01051 Series).

E. Steel Substrates:

1. First Coat:

- a. Benjamin Moore & Co.; Super Spec HP Acrylic Metal Primer P04.
- b. PPG Paints: Pitt-Tech Interior/Exterior Industrial DTM Primer/Finish Enamel 90-712.
- c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Primer Finish B66W1.

2. Second and Third Coats (Semi-Gloss):

- a. Benjamin Moore & Co.; Ultra Spec HP DTM Acrylic Semi-Gloss HP29, or Gloss HP28.
- b. PPG Paints: Pitt-Tech Industrial DTM Acrylic Satin 90-474.
- c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Coating S/G (B66-W01151 Series) or Gloss (B66-W01051 Series.)

F. Steel Substrates (Deep Tone Accent Colors):

- 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Super Spec HP Acrylic Metal Primer P04.
 - b. PPG Paints: Pitt-Tech Interior/Exterior Industrial DTM Primer/Finish Enamel 90-712
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Primer Finish B66W1.
- 2. Second and Third Coats (Semi-Gloss): Additional coats may be required.
 - a. Benjamin Moore & Co.; Ultra Spec HP DTM Acrylic Semi-Gloss HP29 or Gloss HP28.
 - b. PPG Paints: Pitt-Tech Industrial DTM Acrylic Satin 90-474.
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Coating S/G (B66-W01151 Series) or Gloss (B66-W01051 Series.)

G. Previously Painted Steel Cabinet Heaters/ Fin tube Enclosures- up to 250 degrees:

- 1. First Coat:
 - a. Benjamin Moore & Co.; Super Spec HP Acrylic Metal Primer P06.
 - b. PPG Paints; PPG Paints: Pitt Tech DTM Acrylic Metal Primer 90-712
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Primer Finish B66A50.
- 2. Second and Third Coats (Semi-Gloss):
 - a. Benjamin Moore & Co.; Super Spec HP Urethane Alkyd Gloss.
 - b. PPG Paints; PPG Paints Pitt Tech Plus DTM Acrylic Semi-Gloss 4216
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Coating S/G (B66-W01151/B66-W01051).

H. Steel Piping, Piping Supports and Hangers:

1. First Coat:

- a. Benjamin Moore & Co.; Super Spec HP Acrylic Metal Primer P04.
- b. PPG Paints: Pitt-Tech Interior/Exterior Industrial DTM Primer/Finish Enamel 90-712.
- c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Primer Finish B66W1.

2. Second and Third Coats (Semi-Gloss):

- a. Benjamin Moore & Co.; N539 Ultra Spec Interior Semi-Gloss.
- b. PPG Paints: Speedhide Interior Latex Semi-Gloss 6-500.
- c. Sherwin-Williams Company (The); Pro Industrial DTM B66 Series.

I. Galvanized-Metal Substrates:

1. First Coat:

- a. Benjamin Moore & Co.; Super Spec HP Acrylic Metal Primer P04.
- b. PPG Paints: Pitt-Tech Interior/Exterior Industrial DTM Primer/Finish Enamel 90-712.
- c. Sherwin-Williams Company (The); Sherwin Williams Pro Industrial Pro Cryl Universal Primer B66-1310

2. Second and Third Coats:

- a. Benjamin Moore & Co.; Ultra Spec HP DTM Acrylic Semi-Gloss HP29.
- b. PPG Paints: Pitt-Tech Industrial DTM Acrylic Satin 90-474.
- c. Sherwin-Williams Company (The); Pro Industrial DTM B66 Series.

J. Galvanized-Metal Substrates (Metal Deck):

1. First Coat:

- a. Benjamin Moore & Co.; Coronado Super Kote 5000 Dry Fall Latex Flat 105 or Semi-Gloss 112.
- b. PPG Paints: Speed Super Tech Latex Dry Fog Spray Paint 6-724XI.
- c. Sherwin-Williams Company (The); Pro Industrial Waterborne Acrylic Dry Fall Eggshell B42W200082.

2. Second and Third Coats:

- a. Benjamin Moore & Co.; Coronado Super Kote 5000 Dry Latex Semi-Gloss 112.
- b. PPG Paints: Speed Super Tech Latex Dry Fog Spray Paint 6-724XI.
- c. Sherwin-Williams Company (The); Pro Industrial Waterborne Acrylic Dry Fall Eggshell B42W0082.

- K. Galvanized-Metal Substrates (Metal Deck, Deep Tone Accent Colors):
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Super Spec HP Acrylic Metal Primer P04.
 - b. PPG Paints: Pitt-Tech Interior/Exterior Industrial DTM Primer/Finish Enamel 90-712.
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Primer Finish B66 Series.
 - 2. Second and Third Coats (Semi-Gloss):
 - a. Benjamin Moore & Co.; Ultra Spec HP DTM Acrylic Semi-Gloss HP29 or Gloss HP28.
 - b. PPG Paints: Pitt-Tech Interior /Exterior Satin DTM Industrial Enamel 90-474.
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Coating S/G or Gloss B66 Series.
- L. Aluminum Substrates (Where Indicated):
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Super Spec HP Acrylic Metal Primer P04.
 - b. PPG Paints: Pitt-Tech Interior/Exterior Industrial DTM Primer/Finish Enamel 90-712.
 - c. Sherwin-Williams Company (The); DTM Acrylic Primer Finish B66W1.
 - 2. Second and Third Coats (Eggshell):
 - a. Benjamin Moore & Co.; Ultra Spec 500 Interior Eggshell N538.
 - b. PPG Paints: Speedhide Interior Latex Eggshell 6-411.
 - c. Sherwin-Williams Company (The); Pro Industrial DTM B66 Series.
- M. Wood Substrates:
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Fresh Start Multi-Purpose Latex Primer N023.
 - b. PPG Paints: Seal Grip Latex Primer/Finish 17-951.
 - c. Sherwin-Williams Company (The); Premium Interior Wall and Wood Primer B28W8111.
 - 2. Second and Third Coats (Semi-Gloss):
 - a. Benjamin Moore & Co.; N539 Ultra Spec 500 Interior Semi-Gloss.
 - b. PPG Paints: Speedhide Interior Semi-Gloss Latex 6-500.
 - c. Sherwin-Williams Company (The); Pro Mar 200 Zero VOC Interior Latex S/G B31 Series.

- N. Wood Substrates (Deep Tone Accent Colors):
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Fresh Start Multi-Purpose Latex Primer N023.
 - b. PPG Paints: Seal Grip Latex Primer/Finish 17-951.
 - c. Sherwin-Williams Company (The); Premium Interior Wall and Wood Primer B28W8111.
 - 2. Second and Third Coats (Semi-Gloss): Additional coats may be required.
 - a. Benjamin Moore & Co.; Ultra Spec 500 Interior Semi-Gloss N539.
 - b. PPG Paints: Speedhide Interior Semi-Gloss Latex 6-500.
 - c. Sherwin-Williams Company (The); Pro Industrial DTM Acrylic Coating S/G or Gloss B66 Series.

O. Plaster Substrates:

- 1. First Coat:
 - a. Benjamin Moore & Co.; Super Spec Int/Ext 100% Acrylic Masonry Sealer N066.
 - b. PPG Paints: Perma-Crete Alkali-Resistant Primer 4-603.
 - c. Sherwin-Williams Company (The); Loxon Concrete & Masonry Primer LX02W0050.
- 2. Second and Third Coats (Eggshell):
 - a. Benjamin Moore & Co.; N538 Ultra Spec 500 Interior Eggshell.
 - b. PPG Paints: Speedhide Zero Interior Latex Eggshell 6-4310.
 - c. Sherwin-Williams Company (The); Pro Mar 200 0 VOC Interior Latex Egg Shell (B20-2600 Series.)
- P. Plaster Substrates (Deep Tone Accent Colors):
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Fresh Start Primer 023.
 - b. PPG Paints: Perma-Crete Alkali-Resistant Primer 4-603.
 - c. Sherwin-Williams Company (The); Loxon Concrete & Masonry Primer LX02W0050.
 - 2. Second and Third Coats (Eggshell): Additional coats may be required.
 - a. Benjamin Moore & Co.; N538 Ultra Spec 500 Interior Eggshell.
 - b. PPG Paints: Speedhide Zero Interior Latex Eggshell 6-4310.
 - c. Sherwin-Williams Company (The); Pro Mar 200 0 VOC Interior Latex Egg Shell (B20-2600 Series.)

Q. Gypsum Board Substrates:

- 1. First Coat:
 - a. Benjamin Moore & Co.; Fresh Start Multi-Purpose Latex N023.
 - b. PPG Paints: Speedhide Interior Latex Primer/Sealer 6-2
 - c. Sherwin-Williams Company (The); Pro Mar 200 Wall Primer (B28W02600.)
- 2. Second and Third Coats (Eggshell):
 - a. Benjamin Moore & Co.; N538 Ultra Spec 500 Interior Eggshell.
 - b. PPG Paints: Speedhide Interior Latex Eggshell 6-411.
 - c. Sherwin-Williams Company (The); Pro Mar 200 Zero VOC Interior Latex Low Sheen (B20-Series.)
- R. Gypsum Board Substrates (Deep Tone Accent Colors):
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Fresh Start Multi-Purpose Latex N023.
 - b. PPG Paints: Speedhide Interior Latex Primer/Sealer 6-2.
 - c. Sherwin-Williams Company (The); Pro Mar 200 Wall Primer (B28W8200).
 - 2. Second and Third Coats (Eggshell): Additional coats may be required.
 - a. Benjamin Moore & Co.; N538 Ultra Spec 500 Interior Eggshell.
 - b. PPG Paints: Speedhide Interior Latex Eggshell 6-411.
 - c. Sherwin-Williams Company (The); Pro Mar 200 0 VOC Interior Latex Low Sheen (B24-2600 Series).
- S. Insulation-Covering Substrates:
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Fresh Start Multi-Purpose Latex N023.
 - b. PPG Paints: Speedhide Interior Latex Primer/Sealer 6-2.
 - c. Sherwin-Williams Company (The); Prep Rite 200 Interior Latex Primer B28W200.
 - 2. Second and Third Coats (Semi-Gloss):
 - a. Benjamin Moore & Co.; N539 Ultra Spec 500 Interior Semi-Gloss.
 - b. PPG Paints: Speedhide Zero Interior Semi-Gloss Latex 6-4510.
 - c. Sherwin-Williams Company (The); Pro Mar 200 Zero VOC Semi-Gloss B31-2600.
- T. Insulation-Covering Substrates (Deep Tone Accent Colors):
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Fresh Start Multi-Purpose Latex N023.

- b. PPG Paints: Speedhide Interior Latex Primer/Sealer 6-2.
- c. Sherwin-Williams Company (The); Pro Mar 200 Zero VOC Semi-Gloss Primer (B28-2600).
- 2. Second and Third Coats (Semi-Gloss): Additional coats may be required.
 - a. Benjamin Moore & Co.; N539 Ultra Spec 500 Interior Semi-Gloss.
 - b. PPG Paints: Speedhide Zero Interior Semi-Gloss Latex 6-4510.
 - c. Sherwin-Williams Company (The); Pro Mar 200 Zero VOC Interior Latex S/G (B31-2600 Series.)
- U. Textured Plaster/Gypsum Substrates Ceilings:
 - 1. First Coat: Use tinted primer.
 - a. Benjamin Moore & Co.; Ultra Spec Masonry Interior/Exterior Acrylic Masonry Sealer 608.
 - b. PPG Paints: Perma-Crete Alkali Resistant Primer 4-603
 - c. Sherwin-Williams Company (The); Multi-Purpose, interior/exterior latex primer/sealer B51-450 series.
 - 2. Second and Third Coats (Flat): Additional coats may be required.
 - a. Benjamin Moore & Co.; Coronado TexCrete WB Acrylic Masonry Waterproofer Medium Finish, 3196
 - b. PPG Paints: Perma-Crete 100% Acrylic Texture Coating 4-50 Series
 - c. Sherwin-Williams Company (The); Ultra-Crete Textured Masonry Topcoat A44W800 Series.

3.7 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. Stained Wood (Closed or Open Grain):
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Lenmar Interior Waterborne Stain.
 - b. PPG Paints: Olympic Interior Low VOC Oil Stain 44500.
 - c. Sherwin-Williams Company (The); Minwax Wood Finish 250 VOC Compliant Stain (7107 Series).
 - 2. Second and Third Coats (Eggshell/Low Lustre):
 - a. Benjamin Moore & Co.; Benwood Stays Clear Stain Acrylic Polyurethane N423.
 - b. PPG Paints: Olympic Interior Satin Polyurethane 43886.
 - c. Sherwin-Williams Company (The); Minwax High Build Polyurethane Satin (009919945)

- B. Stained Wood (Closed or Open Grain): Apply wood grain filler to open grain wood.
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Lenmar Interior Waterborne Stain.
 - b. PPG Paints: Olympic Interior Low VOC Oil Stain 44500.
 - c. Sherwin-Williams Company (The); Minwax Wood Finish 250 VOC Compliant Stain (7107 Series)
 - 2. Second and Third Coats (Semi-Gloss/High Gloss):
 - a. Benjamin Moore & Co.; Benwood Stays Clear Semi-Gloss Acrylic Polyurethane N422.
 - b. PPG Paints: Olympic Interior Semi-Gloss Satin Polyurethane 43886.
 - c. Sherwin-Williams Company (The); Minwax High Build Polyurethane Semi-Gloss (009919937) or Gloss (009919929)
- C. Clear Finish Wood (Closed Grain):
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Benwood Stays Clear Acrylic Polyurethane N423.
 - b. PPG Paints: Olympic Interior Gloss Polyurethane 43886 (Quart size only-OTC).
 - c. Sherwin-Williams Company (The); Minwax High Build Polyurethane Satin (009919945).
 - 2. Second and Third Coats (Satin/Low Lustre):
 - a. Benjamin Moore & Co.; Benwood Stays Clear Satin Acrylic Polyurethane N423.
 - b. PPG Paints: Olympic Interior Satin Polyurethane 43884 thinned (Quart size only OTC).
 - c. Sherwin-Williams Company (The); Minwax High Build Polyurethane Satin (009919945).
- D. Clear Finish Wood (Closed Grain):
 - 1. First Coat:
 - a. Benjamin Moore & Co.; Benwood Stays Clear Acrylic Polyurethane N422.
 - b. PPG Paints: Olympic Interior Gloss Polyurethane 43884 thinned (Quart size only OTC).
 - c. Sherwin-Williams Company (The); Minwax High Build Polyurethane Satin (009919945)

- 2. Second and Third Coats (Semi-Gloss/High Gloss):
 - a. Benjamin Moore & Co.; Benwood Stays Clear Semi-Gloss Acrylic Polyurethane N422.
 - b. PPG Paints: Olympic Interior Semi-Gloss Polyurethane 43884 (Quart size only OTC).
 - c. Sherwin-Williams Company (The); Minwax High Build Polyurethane Semi-gloss (009919945).

END OF SECTION 09 91 00

SECTION 09 96 00 – HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and application of high-performance coating systems, for the following:
 - 1. Exterior applications.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product for substrates indicated. Include preparation requirements and application instructions. Include all paint products under one cover sheet.
 - 1. Exterior steel.
 - 2. Exterior galvanized metal.
 - 3. Exterior wood.
 - 4. Exterior aluminum.
 - 5. Exterior urethane.
 - 6. Exterior CMU.
- B. Samples for Verification and Initial Selection: For each type of coating system and in each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. VOC content.

1.5 QUALITY ASSURANCE

A. Qualification Data: For applicator.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- 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. Coatings: 10 percent, but not less than 1 gal. of each material and color applied.

1.7 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual, experienced in applying high performance coatings specified in this Section, who has successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; familiar with special requirements indicated; and with sufficient trained staff to apply manufacturer's products according to specified requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.9 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F.
- B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior coatings in snow, rain, fog, or mist.
- D. Lighting: Do not install high-performance coatings until a lighting level of not less than 80 fc is provided on the surfaces to receive coating.

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 the following:
 - 1. Benjamin Moore & Co.
 - 2. Sherwin-Williams Company (The).
 - 3. Tnemec Inc.

- B. Submittals containing manufactures other than stated above, will require a product by product comparison for each type of paint. All Comparable equals are to be matched with corresponding Sherwin Williams's specified products.
- C. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in Part 3 articles for the application indicated.

2.2 HIGH PERFORMANCE COATINGS, GENERAL

A. Material Compatibility:

- 1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a coating system, provide products recommended in writing by manufacturers of topcoat for use in coating system and on substrate indicated.
- 3. Provide products of same manufacturer for each coat in a coating system.
- B. VOC Compliance: Provide exterior coating products complying with New York requirements for Volatile Organic Compound (VOC) and Ozone Transport Commission (OTC) regulations, January 2005.
- C. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Concrete: 12 percent.
 - b. Masonry (Clay and CMU): 12 percent.
 - c. Wood: 15 percent.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- B. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.
- C. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- D. Masonry Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning."
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal using bio-degradable detergent. Then abrasive blast with fine abrasive to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.
- H. Aluminum Substrates: Remove loose surface oxidation by scarification.
- I. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer apply coat of knot sealer recommended in writing by topcoat manufacturer for coating system indicated.
 - 2. Sand surfaces that will be exposed to view and dust off.
 - 3. Prime edges, ends, faces, undersides, and back sides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- J. Galvanized Metal/Galvanized Deck- Factory Primed Surface: Coordinate with approved paint manufacturer on compatibility of paint finish coats to factory prime surface.

K. After removing all surface contamination, the surface should be scuff sanded or scrubbed with an abrasive cleaner to dull the surface for best adhesion.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
 - 1. Contractor shall touch up and restore coated surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates:

1. First Coat:

- a. Benjamin Moore & Co. (No Zinc primers) suggest Corotech V160 Epoxy Mastic Coating @4.6-7.2 DFT.
- b. Sherwin-Williams Company (The); Corothane 1 Gal-Va-Pac Zinc Primer B65G00010 at 3.0-4.0 mils DFT.
- c. Tnemec Inc.; Series 90-97 Tneme-Zinc at 2.5 to 3.5 mils DFT.

2. Second Coat:

- a. Benjamin Moore & Co. Corotech V160 Epoxy Mastic Coating @4.6-7.2 DFT
- b. Sherwin-Williams Company (The); Macropoxy 646 B58 series 7.0-5.0 mils DFT
- c. Tnemec Inc.; Series 66HS Hi-Build Epoxoline at 3.0 to 5.0 mils DFT.

3. Third Coat:

- a. Benjamin Moore & Co. Corotech V500 Acrylic Aliphatic Urethane Coating Gloss or V510 Acrylic Aliphatic Urethane Coating Semi-Gloss at 3.2-4.6 mils DFT
- b. Sherwin-Williams Company (The); Hi Solids Polyurethane B65 series 4.5-3.0 mils
- c. Tnemec Inc.; Series 1074 or 1095 Endura-Shield II at 2.0 to 5.0 mils DFT.

B. Galvanized-Metal Substrates:

1. First Coat:

- a. Benjamin Moore & Co. Corotech V160 Epoxy Mastic Coating @4.6-7.2 DFT
- b. Sherwin-Williams Company (The); Macropoxy 646 B58 series 7.0-5.0 mils DFT
- c. Tnemec Inc.; Series 66HS Hi-Build Epoxoline at 3.0 to 5.0 mils DFT.

2. Second Coat:

- a. Benjamin Moore & Co. Corotech V500 Acrylic Aliphatic Urethane Coating Gloss or V510 Acrylic Aliphatic Urethane Coating Semi-Gloss at 3.2-4.6 DFT
- b. Sherwin-Williams Company (The); Hi Solids Polyurethane B65 series 4.5-3.0 mils DFT
- c. Tnemec Inc.; Series 1074 or 1095 Endura-Shield II at 2.0 to 5.0 mils DFT.

C. Wood Substrates:

1. First Coat:

- a. Benjamin Moore & Co. Insul-X Aqua Lock Plus Primer
- b. Sherwin-Williams Company (The); Exterior Oil-Based Wood Primer Y24W8020 at 2.3 mils DFT
- c. Tnemec Inc.; Series V10-99W Primer

2. Second and Third Coat:

- a. Benjamin Moore & Co. Corotech V331 Acrylic DTM Enamel Semi-Gloss at 2-2.2 DFT (third coat of same)
- b. Sherwin-Williams Company (The); Sher-Cryl HPA High Performance Acrylic Semi-Gloss B66W350 at 2.5-4.0 mils DFT.
- c. Tnemec Inc.; Series 1029 Enduratone

D. Aluminum Substrates:

1. First Coat:

- a. Benjamin Moore & Co. Corotech V160 Epoxy Mastic Coating @4.6-7.2 DFT
- b. Sherwin-Williams Company (The); Macropoxy 646 Fast Cure Epoxy B58W610 at 5.0-10.0 mils DFT
- c. Tnemec Inc.; Series 66HS Hi-Build Epoxoline at 4.0-6.0 mils DFT

2. Second Coat:

- a. Benjamin Moore & Co. Corotech V500 Acrylic Aliphatic Urethane Coating Gloss or V510 Acrylic Aliphatic Urethane Coating Semi-Gloss at 3.2-4.6 DFT
- b. Sherwin-Williams Company (The); Hi Solids Polyurethane B65 series 4.5-3.0 mils DFT
- c. Tnemec Inc.; Series 1074 or 1095 Endura-Shield II at 2.0-5.0 mils DFT

E. Urethane Substrates:

1. First Coat:

- a. Benjamin Moore & Co. Insl-X Stix XSA 110 Bonding Primer
- b. Sherwin-Williams Company (The); Multi-Purpose Interior/Exterior Latex Primer/Sealer B51-450 Series at 1.4 mils DFT.
- c. Tnemec Inc.; Series 151-1051 Elasto-Grip F.C. at 1.0 to 2.0 mils DFT.

2. Second and Third Coat:

- a. Benjamin Moore & Co. Corotech V331 Acrylic DTM Enamel Semi-Gloss at 2-2.2 DFT (third coat of same)
- b. Sherwin-Williams Company (The); Sher-Cryl HPA High Performance Acrylic Semi-Gloss B66W350 at 2.5-4.0 mils DFT.
- c. Tnemec Inc.; Series 1029 Enduratone.

F. CMU:

1. First Coat:

- a. Benjamin Moore & Co. Ultra-Spec Masonry 100% Acrylic Masonry 608 Flat @9. DFT
- b. Sherwin-Williams Company (The) Con-Flex XL High Build Coating A05W451 at 6.0-7.5 mils DFT.
- c. Tnemec Inc.; Series 156 Color Enviro-Crete @4.0-8.0 mils DFT (use Tnemec-Tape for cracks larger than 1/64" wide)

2. Second Coat:

- a. Benjamin Moore & Co. Super Spec Masonry 100% Acrylic Elastomeric 360.
- b. Sherwin-Williams Company (The); Con-Flex XL High Build Coating A05W451 at 6.0-7.5 mils DFT.
- c. Tnemec Inc.; Series 156 Color Enviro-Crete @4.0-8.0 mils DFT

END OF SECTION 09 96 00

SECTION 10 12 00 - DISPLAY CASES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Non-illuminated bulletin boards.

1.3 DEFINITIONS

A. Bulletin Board: Tackable visual display surface or tackboard enclosed in a display case.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for bulletin boards.
 - 1. Vinyl-fabric-faced tackboard.
 - 2. Non-illuminated bulletin boards; hinged doors.
 - 3. Display cases.
- B. Shop Drawings: For bulletin boards. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Installation Details.
 - 2. Correct size of unit
 - 3. Field verified dimensions.
- C. Samples for Verification and Initial Color Selection: For units with factory-applied color finishes, and as follows:
 - 1. Actual sections of visual display surfaces.
 - 2. Trim: 6-inch-long sections of each trim profile.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for surface-burning characteristics of fabrics.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For visual display surfaces to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Source Limitations: Obtain bulletin board from single source from 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.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.
- 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. Preinstallation Conference: Conduct conference at Project site.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install units until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Verify actual dimensions of openings for bulletin boards by field measurements before fabrication or placing order.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hardboard: ANSI A135.4, tempered.
- B. Hardwood Plywood: HPVA HP-1.
- C. Hardwood backed HPL "Designer White"
- D. Vinyl Fabric: FS CCC-W-408D, Type II; weighing not less than 15 oz./sq. yd.; with flame-spread index of 25 or less when tested according to ASTM E 84.

- E. Extruded-Aluminum Bars and Shapes: ASTM B 221, Alloy 6063.
- F. Aluminum Tubing: ASTM B 429, Alloy 6063.
- G. Clear Tempered Glass: Glass must comply with CPSC 16 CFR- Safety standards for architectural glazing materials, ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality Q3, with exposed edges seamed before tempering, and 5 mm thick unless otherwise indicated.
- H. Opaque Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet).
- I. Fasteners: Provide screws, bolts, and other fastening devices made from same material as items being fastened. Provide types, sizes, and lengths to suit installation conditions. Use security fasteners where exposed to view.

2.2 BULLETIN BOARD

- A. Non-illuminated Bulletin Boards; Hinged Doors:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Claridge Products and Equipment, Inc.; Contemporary Series Bulletin Boards or comparable product by one of the following:
 - a. Best-Rite Manufacturing.
 - b. Marsh Industries, Inc.; Visual Products Group.
- B. General: Factory-fabricated unit consisting of manufacturer's standard wall-mounted cabinet with tackboard assembly on back inside surface and operable glazed doors at front.
- C. Aluminum-Framed Cabinet: Extruded aluminum; with Satin Anodized finish.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.
- D. Cabinet Corners: Square.
- E. Glazed Hinged Doors: Tempered glass; compliant with CPSC 16 CFR- Safety standards for architectural glazing materials, set in frame matching cabinet material and finish. Equip each door with full-height continuous hinge and cylinder lock with two keys.
 - 1. Thickness: Not less than 5 mm thick.
 - 2. Number of Doors: Two.
- F. Tack Surface: Vinyl-fabric-faced tackboard assembly.
 - 1. Color: As selected by Architect from full range of industry colors.
- G. Width: As indicated on Drawings.
- H. Height: As indicated on Drawings.
- I. Depth: 4 inches

- J. Mounting Height: As indicated on Drawings.
- K. Mounting: Recessed.

2.3 FABRICATION

- A. Fabricate bulletin boards to requirements indicated for dimensions, design, and thickness and finish of materials.
- B. Use metals and shapes of thickness and reinforcing to produce flat surfaces, free of oil-canning, and to impart strength for size, design, and application indicated.
- C. Fabricate cabinets and door frames with reinforced corners, mitered to a hairline fit, with no exposed fasteners.
- D. Fabricate shelf standards plumb and at heights to align shelf brackets for level shelves.

2.4 GENERAL FINISH REQUIREMENTS

- 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. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
- B. 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power system to verify actual locations of connections before installation of illuminated units.
- C. Examine walls and partitions for proper backing for bulletin boards.
- D. Examine walls and partitions for suitable framing depth if recessed units will be installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
- F. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Prepare recesses for bulletin boards as required by type and size of unit.

3.3 INSTALLATION

- A. General: Install units 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.
- B. Bulletin Boards: Attach units with manufacturer's standard concealed hardware.
- C. Install display case shelving level and straight.

3.4 ADJUSTING AND CLEANING

- A. Adjust doors to operate smoothly without warp or bind and so contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 10 12 00

SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Room identification sign system.
- 2. Identification of buildings utilizing Truss Type Construction.
- 3. Signage accessories.
- 4. Signage Schedule.

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of sign required, including construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- C. Shop Drawings: Submit shop drawings for fabrication and erection of interior signs, including plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, mounting heights, layout, spacing, reinforcement, accessories, and installation details. Shop drawings are to be including but not limited to:
 - 1. Message list for each sign.
 - 2. Large-scale details of wording, lettering artwork and Braille layout.
 - 3. Complete color list both standard and custom colors.
 - 4. Photocopies of Tetra Tech documentation not acceptable.
 - 5. Fasteners and anchors.
 - 6. Signage Schedule.

- 7. Adhesives.
- 8. Two-face tape.
- D. Samples for Verification and Initial Color Selection: For each type of sign assembly, exposed component, and exposed finish.
 - 1. Include representative Samples of available typestyles and graphic symbols.
 - 2. Panel Signs: Full-size Sample.
 - 3. Field-Applied, Vinyl-Character Signs: Full-size Sample of characters on glass.
- E. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.
- F. Sample Warranty: For special warranty.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For signs to include in maintenance manuals.
- B. Warranty: Executed special warranty.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
 - 1. Qualifications
 - a. Manufacturer: Obtain each sign type and all associated accessories through one source from single manufacturer.
 - b. Installer: Workers to be approved by signage manufacturer and supply list of recently completed installations.
 - 2. Regulatory Requirements
 - a. ADA Compliance: Comply with the Americans with Disabilities Act (ADA), and with code provisions as adopted by authorities having jurisdiction.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.

- b. Deterioration of graphic image.
- c. Separation or delamination of sheet materials and components.
- 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities, ICC A117.1, and building code in effect for Project, for signs.
- B. Fire Rating: Provide sign material with Class C fire rating.

2.2 SIGNS

- A. Basis-of-Design Product: For convenience detail and specifications have been based on "Embossed" by ASI Signage Systems, Grand Island, New York. Other manufactures offering comparable product by one of the following:
 - 1. Mohawk Engraving Co.; Schenectady, New York
 - 2. Best Sign Systems Inc.

PART 3 - SIGN SYSTEM

3.1 ROOM IDENTIFICATION SIGN SYSTEM

- A. Materials: Metal Embossed aluminum.
 - 1. Sign Face: Encapsulated poly-carbonate layer chemically bonded to 1/16" one piece aluminum substrate with painted edges.
 - 2. Tactile Graphics and Text: Integral to face.
 - 3. Finish: Selected by Architect from manufacturer's full range of standard and custom nonglare finishes.
 - 4. Contrast: Selected by Architect from dark characters on light background or light characters on dark background.
 - 5. Similar to "Emboss" by ASI Sign Systems
- B. Interior Signage Types: New York Not all types may be applicable for project. Refer to Signage Schedule for specific text and quantities:
 - 1. Type 5: Room Name/Number Sign: 6"x6" sign.
 - a. Text: All room numbers printed in minimum 1" high sans serif lettering and two lines, where needed. All room names printed in minimum 5/8" high lettering.

- 2. Type 11a: Identification of Buildings Utilizing Truss Type Construction Decal: 6"x6".
 - a. Graphics: as Type 11 above.
 - b. Text: as Type 11 above.
 - c. Decal to be adhesive on side as required for installation.

3.2 ACCESSORIES

- A. 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. Provide inserts, as required, to be set into concrete or masonry work.
- B. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:
- C. Adhesives: As recommended by sign manufacturer and with a VOC content 4 g/L or less for adhesives used inside the weatherproofing system and applied on-site when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

3.3 FABRICATION

- A. Fabrication: Comply with requirements of The Americans Disabilities Act (ADA) of 1990 and dimensions and characteristic given below and in 'Interior Signage Types'.
 - 1. Braille Characters: Grade 2 Braille (literary Braille) consisting of 189 part words or whole word contractions, in addition to 63 Grade 1 Braille characters.
 - 2. Character Height (based on upper case): 5/8-inch minimum; 3 inches maximum.
 - 3. Tactile Characters: Raised 1/32-inch minimum thickness.
 - 4. Type Style: All upper case letters, without serifs or with simple serifs.
 - 5. Symbols: Provide border around symbol (not required to be raised) with verbal description placed directly below symbol in 1/32 inch raised and Braille characters.
 - 6. Color: Up to 5 colors throughout school, as selected by Architect from manufacturer's full color range.
- B. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

3.4 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 4 - EXECUTION

4.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

4.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
 - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
- B. Mounting Locations: Walls adjacent to latch side of door 60 inches from center of sign to finished floor, and 2 inches from edge of doorframe. Where wall space adjacent to latch side of door is not available, and at double leaf doors, place sign on nearest adjacent wall.

C. Mounting Methods:

- 1. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.
 - a. Vinyl-Tape Mounting (Semi-Permanent Installations): Double sided tape to mount signs to smooth, non-porous surfaces. Not suitable for rough, or vinyl covered surfaces.
 - b. Silicone Adhesive: To be used with Vinyl Tape. Suitable for most wall surfaces, including vinyl. Provide adhesive as recommended by sign manufacturer.
- D. Field-Applied, Vinyl-Character Signs: Clean and dry substrate. Align sign characters in final position before removing release liner. Remove release liner in stages, and apply and firmly press characters into final position. Press from the middle outward to obtain good bond without blisters or fishmouths. Remove carrier film without disturbing applied vinyl film.

4.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

PART 5 - SIGN SCHEDULES

5.1 SIGN SCHEDULES

- A. All permanent rooms to receive room identification system containing both text and room numbers.
- B. Provide barrier-free and tactile signage at all locations required by code and as shown on the architectural drawings.
- C. Coordinate mounting heights as per CABO/ANSI A117.1 and as per manufacturer's recommendations.
- D. All room names and numbers are subject to change, Supplier to verify with school district during construction phase, prior to submittal phase, for final room names and numbers.
- E. All colors to be issued during construction- colors are to be selected by district/client.
- F. Provide signs as per signage schedule below, as require by code and signage drawing.

COLOR	ROOM NO.	SIGNAGE TYPE	SIGNAGE TEXT	REMARKS
			Springhurst Elementary	
	V101A	5	Name by district	
	V101	5	Name by district	
	S-64	5	Name by district	TYPE 5 AT ALL DOORS
	S-64B	5	Name by district	

		Middle School	
201A	5	Name by district	

END OF SECTION 10 14 00

SECTION 10 14 19 - DIMENSIONAL LETTER SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Precision Cut Acrylic dimensional characters.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For dimensional letter signs.
 - 1. Include fabrication and installation details and attachments to other work.
 - 2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 3. Show message list, typestyles, graphic elements, and layout for each sign at least half size.
- C. Samples for Verification and Initial Color Selection: For each type of sign assembly, exposed component, and exposed finish.
 - 1. Include representative Samples of available typestyles and graphic symbols.
 - 2. Dimensional Characters: Full-size Sample of each type of dimensional character.
- D. Sign Schedule: Use same designations specified or indicated on Drawings.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify locations by field measurements before fabrication, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: For exterior fabricated channel dimensional characters, allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 DIMENSIONAL CHARACTERS

- A. Acrylic Characters: Precision Cut Acrylic Painted letters characters having uniform faces and profiles, and as follows:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide ASI Sign Systems, Inc.; LPP Series or comparable product by one of the following:
 - a. ACE Sign Systems, Inc.
 - b. Gemini Incorporated.
 - c. Metallic Arts.
 - 2. Color: Manufacturer's standard painted finish process, in color as selected by Architect from manufacturer's full range.
 - 3. Typeface: Helvetica, Optimal, Times New Roman or as indicated.

2.3 DIMENSIONAL CHARACTER MATERIALS

- A. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).
- B. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 ACCESSORIES

- A. Adhesives: As recommended by sign manufacturer and that 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. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045-inch-thick, with adhesive on both sides.

2.5 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 - 1. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.
- D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.
- E. Clear Organic Coating: Clear, waterborne, air-drying, acrylic lacquer called "Incralac"; specially developed for coating copper-alloy products; consisting of a solution of methyl methacrylate copolymer with benzotriazole to prevent breakdown of the film in UV light; shop applied in two uniform coats per manufacturer's written instructions, with interim drying between coats and without runs or other surface imperfections, to a total dry film thickness of 1 mil.

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 signage work.

- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
 - 3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:

- 1. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
- 2. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position and push to engage tape adhesive.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 19

SECTION 10 14 53 - TRAFFIC SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Traffic signs. Related Sections:
 - 1. Section 03 30 30 "Cast-In-Place Concrete"

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Traffic signs.
 - 2. Traffic sign posts.
- B. Shop Drawings: For traffic signage.
 - 1. Include fabrication and installation details and attachments to other work.
 - 2. Show sign mounting heights and accessories.
 - 3. Show message list, typestyles, graphic elements, and layout for each sign at least half size.
- C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
 - 1. Include representative Samples of available typestyles and graphic symbols.
 - 2. Include color samples.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Comply with all applicable state and local requirements for traffic signs, including (but not limited to) reflectivity, foundation construction, and wind resistance.
 - 1. Comply with U.S. Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD), AASHTO M268 and NYSDOT standard specifications and regulations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard:
 - 1. Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities, ICC A117.1, and building code in effect for Project for signs.
 - 2. Comply with applicable provisions in the New York State Department of State Division of Administrative Rules, Part 300 Universal Symbol of Access, Part 300.4 Accessible Wording, Part 300.5 Accessible Symbol, Part 300.6 Accessibility Graphic and Components, and building code in effect for Project for signs.

2.2 TRAFFIC SIGNS

- A. Traffic Sign: Sign of single-panel configuration; with smooth, uniform surfaces and support assembly; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
- B. <u>Basis-of-Design Product</u>: Subject to compliance with requirements, provide product indicated or comparable product.
 - 1. Allstate Sign & Plaque Corporation; Aluminum Traffic & Parking Signs.

C. Materials:

- 1. Solid-Sheet Sign Panels: Aluminum sheet and as follows:
 - a. Thickness: 0.080 inch.
 - b. Surface-Applied Graphics: Applied vinyl film.
- 2. Posts: Steel.
 - a. Description: Hot-dipped galvanized round steel post with vandal-proof cap and U-channel with baked enamel or powder coated with U-channel with breakaway base
 - b. Installation Method: Direct burial and in concrete.

- 3. Text and Typeface: Typeface as selected by Architect from manufacturer's full range and content as scheduled.
- 4. Reflectivity:
 - a. Traffic control, directional and guide signage: Provide high intensity prismatic reflective sheeting (Federal DOT Type III and IV Reflective).
 - b. Parking and informational signage: Provide engineer grade prismatic reflective sheeting (Federal DOT Type 1 Reflective).

2.3 MATERIALS

- A. Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- C. Steel Materials:
 - 1. U-Channel posts: Powdercoated U-channel steel.
 - a. Strength: 3 lbs. per footb. Length: 8-ft minimum
 - 2. Galvanized Steel Pipe: Group IC, SS40, round steel electric-resistance-welded pipe.
 - a. Diameter: 3.000-inches
 - b. Steel Cap for Round Post: Galvanized steel with vandal-resistant secure fit to pipe.
 - c. Length: 8-ft minimum
 - 3. Steel Tubing: ASTM A 500, Grade B.
 - 4. Bolts for Steel Framing: ASTM A 307 or ASTM A 325 as necessary for design loads and connection details.
 - 5. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.
- D. Concrete: Comply with requirements in Section 03 30 00 "Cast-in-Place Concrete for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3,000 psi.

2.4 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:
 - 1. Furnish nonferrous-metal, stainless-steel, or hot-dip galvanized devices unless otherwise indicated.

2.5 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
- B. Sign Message Panels: Construct sign-panel surfaces to be smooth and to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.
 - 1. Increase panel thickness or reinforce with backing materials as needed to produce surfaces without distortion, buckles, warp, or other surface deformations.
- C. Post Fabrication: Fabricate posts designed to withstand wind pressure indicated for Project location and of lengths required for installation method indicated for each sign.
 - 1. Steel Posts: Fabricate from steel tubing unless otherwise indicated. Include post caps, reinforcement where required for loading conditions, and related accessories required for complete installation.
 - 2. Direct Burial: Fabricate posts 36 inches longer than height of sign to permit direct burial or embedment in concrete-filled postholes.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 METALLIC-COATED STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: Provide factory-applied manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
- B. Galvanized Finish: Type B, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.

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 signage work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. General: Install signs using installation methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Install signs so they do not protrude or obstruct according to accessibility standard.
 - 3. Before installation, verify that sign components are clean and free of materials or debris that would impair installation.

3.3 INSTALLING POSTS

- A. Vertical Tolerance: Set posts plumb within a tolerance of 1/16 inch in 3 feet.
- B. Direct-Burial Method:
 - 1. Excavation: Excavate posthole to dimensions indicated. Reconstruct subgrade that is not firm, undisturbed, or compacted soil, or that is damaged by freezing temperatures, frost, rain, accumulated water, or construction activities by excavating an additional 12 inches, backfilling with satisfactory soil or well-graded aggregate, and compacting to original subgrade elevation.
 - 2. Setting in Cast-in-Place Concrete: Set post in position, support to prevent movement, and place concrete in posthole as indicated.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 53

SECTION 10 22 13 - WIRE MESH PARTITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Standard-duty wire mesh partitions.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wire mesh items.
 - 1. Standard-duty wire mesh partitions.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Setting Drawings: For anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.
- D. Samples: For units with factory-applied color finishes.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For wire mesh unit hardware to include in maintenance manuals.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver wire mesh items with cardboard protectors on perimeters of panels and doors and with posts wrapped to provide protection during transit and Project-site storage. Use vented plastic.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh units by field measurements before fabrication.

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. Acorn Wire & Iron Works, LLC.
 - 2. G-S Company (The).
 - 3. Miller Wire Works, Inc.
 - 4. Standard Wire & Steel Works.

2.2 MATERIALS

- A. Steel Wire: ASTM A 510.
- B. Steel Plates, Channels, Angles, and Bars: ASTM A 36/A 36M.
- C. Panel-to-Panel Fasteners: Manufacturer's standard steel bolts, nuts, and washers.
- D. Post-Installed Anchors: Capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
 - 1. Stainless Steel: Alloy Group 1 or 2 stainless steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.3 STANDARD-DUTY WIRE MESH PARTITIONS

- A. Mesh: 0.135-inch-diameter, intermediate-crimp steel wire woven into 1-1/2-inch diamond mesh.
- B. Vertical Panel Framing: 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels with holes for 1/4-inch-diameter bolts not more than 12 inches on center.
- C. Horizontal Panel Framing: 1-by-1/2-by-1/8-inch cold-rolled steel channels.
- D. Horizontal Panel Stiffeners: Two cold-rolled steel channels, 3/4 by 3/8 by 1/8 inch, bolted or riveted toe to toe through mesh or one 1-by-1/2-by-1/8-inch cold-rolled steel channel with wire mesh woven through channel.
- E. Top Capping Bars: 2-1/4-by-1-inch cold-rolled steel channels.

- F. Posts for Other-Than 90-Degree Corners: Steel pipe or tubing with holes for 1/4-inch-diameter bolts aligning with bolt holes in vertical framing; with floor anchor clips.
 - 1. Partitions up to 12 Feet High: 1-1/4-inch OD by 1/8 inch.
 - 2. Partitions up to 20 Feet High: 2-1/2-inch OD by 1/8 inch.
- G. Line Posts: 3-inch-by-4.1-lb or 3-1/2-by-1-1/4-by-0.127-inch steel channels; with 5-by-18-by-1/4-inch steel base plates.
- H. Floor Shoes: Metal, not less than 2 inches high; sized to suit vertical framing, drilled for attachment to floor, and with set screws for leveling adjustment.
- I. Swinging Doors: Fabricated from same mesh as partitions, with framing fabricated from 1-1/4-by-1/2-by-1/8-inch steel channels or 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels, banded with 1-1/4-by-1/8-inch flat steel bar cover plates on three sides, and with 1/8-inch-thick angle strike bar and cover on strike jamb.
 - 1. Hinges: Full-surface type, 3-by-3-inch steel, 1-1/2 pairs per door; bolted, riveted, or welded to door and jamb framing.
- J. Finish: Enamel finish or powder-coated finish unless otherwise indicated.
 - 1. Color: As selected by Architect from manufacturer's full range.

2.4 FABRICATION

- A. General: Fabricate wire mesh items from components of sizes not less than those indicated. Use larger-sized components as recommended by wire mesh item manufacturer. Furnish bolts, hardware and accessories required for complete installation, with manufacturer's standard finishes.
- B. Standard-Duty Wire Mesh Partitions: Fabricate wire mesh partitions with cutouts for pipes, ducts, beams, and other items indicated. Finish edges of cutouts to provide a neat, protective edge.
 - 1. Mesh: Securely clinch mesh to framing.
 - 2. Framing: Fabricate framing with mortise and tenon corner construction.
 - a. Provide horizontal stiffeners as indicated or, if not indicated, as required by panel height and as recommended by wire mesh partition manufacturer. Weld horizontal stiffeners to vertical framing.
 - b. Fabricate three- and four-way intersections using manufacturer's standard connecting clips and fasteners.
 - 3. Fabricate wire mesh partitions with 3 to 4 inches of clear space between finished floor and bottom horizontal framing.

- 4. Doors: Align bottom of door with bottom of adjacent panels.
 - a. For doors that do not extend full height of partition, provide transom over door, fabricated from same mesh and framing as partition panels.
- 5. Hardware Preparation: Mortise, reinforce, drill, and tap doors and framing as required to install hardware.

2.5 STEEL AND IRON FINISHES

- A. Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-on powder-coat finish, suitable for use indicated, with a minimum dry film thickness of 2 mils.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

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 the Work.
- B. Examine floors for suitable conditions where wire mesh items will be installed.
- C. Examine walls to which wire mesh items will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 WIRE MESH PARTITIONS ERECTION

- A. Anchor wire mesh partitions to floor with 3/8-inch-diameter, postinstalled expansion anchors at 12 inches o.c. through floor shoes located at each post and corner. Adjust wire mesh partition posts in floor shoes to achieve level and plumb installation.
- B. Anchor wire mesh partitions to walls at 12 inches o.c. through back corner panel framing and as follows:
 - 1. For concrete and solid masonry anchorage, use expansion anchors.
 - 2. For hollow masonry anchorage, use toggle bolts.
 - 3. For steel-framed gypsum board assemblies, use lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
- C. Secure top capping bars to top framing channels with 1/4-inch-diameter "U" bolts spaced not more than 28 inches o.c.

- D. Provide line posts at locations indicated or, if not indicated, as follows:
 - 1. For partitions that are 7 to 9 feet high, spaced at 15 to 20 feet o.c.
- E. Where standard-width wire mesh partition panels do not fill entire length of run, provide adjustable filler panels to fill openings.
- F. Install doors complete with door hardware.
- G. Bolt accessories to wire mesh partition framing.

3.3 ADJUSTING AND CLEANING

- A. Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly. Confirm that latches engage accurately and securely without forcing or binding.
- B. Remove and replace defective work including doors and framing that are warped, bowed, or otherwise unacceptable.
- C. 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 shop-painted surfaces.

END OF SECTION 10 22 13

SECTION 10 82 00 - GRILLES AND SCREENS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fixed extruded-aluminum louvered rooftop equipment screens.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of screens assembled from standard components.
- B. Shop Drawings: Include plans, elevations, sections, and attachment details.
- C. Samples: For products involving selection of color, texture, or design.
- D. 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.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of construction contiguous with screens by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of screens and are based on the specific system indicated. See Section 01 60 00 "Product Requirements."
 - 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.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design screens, including attachment to building construction.
- B. Structural Performance: Screens, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior screens 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.

2.3 EXTRUDED-ALUMINUM ROOF TOP EQUIPMENT SCREEN

- A. Horizontal Blade Louvered Roof Top Equipment Screen:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Architectural Louvers, Harray, LLC; Model V4JS or comparable product by one of the following:
 - a. Airline Louvers, a division of Mestek, Inc.
 - b. Airolite Company, LLC (The).
 - 2. Louver Depth: 4 inches.
 - 3. Blade Profile: Plain blade without center baffle.
 - 4. Blade Nominal Thickness: Not less than 0.080 inch.
 - 5. Framing Support Nominal Thickness: Not less than 0.125 inch.
 - 6. Mullions: Fully recessed.

- 7. Corners: Mitered.
- 8. Access: Metal ladder, from roof
- 9. Louver Performance Ratings:
 - a. Free Area: Not less than 8.0 sq. ft. for 48-inch-wide by 48-inch-high louver assembly.

2.4 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.
- B. Extruded Shapes: ASTM B 221, Alloy 6063-T5.
- C. Sheet: ASTM B 209, Alloy 3003 with temper as required for forming.

2.5 FASTENERS

- A. Fastener Materials: Unless otherwise indicated, provide the following:
 - 1. Aluminum Components: Type 316 stainless-steel fasteners.
- B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring screens to other types of construction indicated and capable of withstanding design loads.

2.6 FABRICATION

- A. General: Fabricate screens 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 screens 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. Locate weep holes in inconspicuous locations.

- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect screen members to other work unless otherwise indicated.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. 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. Provide exposed fasteners with finish matching appearance, including color and texture, of screens.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- A. High-Performance Organic Finish: Three-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing screens. Set screens 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 screen 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.

- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- D. Adjust screens before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing screens and for properly transferring loads to in-place construction.

3.3 CLEANING

- A. Clean aluminum steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.
- B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material 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.

3.4 PROTECTION

- A. Protect finishes of screens from damage during construction period with temporary protective coverings approved by screen 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 the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 10 82 00

SECTION 11 52 13 - PROJECTION SCREENS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Manually operated Chroma Key Green

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Manually operated Chroma Key Green
- B. Shop Drawings: For projection screens. Show layouts and types of projection screens. Include the following:
 - 1. For manually operated projection screens:
 - a. Drop lengths.
 - b. Anchorage details.
 - c. Accessories.
- C. Samples for Verification and Initial Color Selection: For finishes of surface-mounted screen cases.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For projection screens to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Source Limitations for Projection Screens: Obtain each type of projection screen from single manufacturer. Obtain accessories, including necessary mounting hardware, from screen manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Environmental Limitations: Do not deliver or install projection screens until spaces are enclosed and weather-tight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.8 COORDINATION

A. Coordinate layout and installation of projection screens with adjacent construction, including ceiling suspension systems, light fixtures, HVAC equipment, fire-suppression system, and partitions.

PART 2 - PRODUCTS

2.1 MANUALLY OPERATED PROJECTION SCREENS

- A. Heavy Duty ceiling mounted, Metal-Encased Chroma Key Green, Manually Operated Screens: 12' x 12' screen, units designed and fabricated for surface mounting on wall or ceiling, fabricated from formed-steel sheet not less than 0.027 inch thick or from aluminum extrusions; with flat back design and vinyl covering or baked-enamel finish. Provide units with matching end caps and concealed mounting, provide with 6' operating pole.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Draper Inc.; VCB Luma 2.

PART 3 - EXECUTION

3.1 PREPARATION

A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

END OF SECTION 11 52 13

PART 1 - GENERAL

1.1 SUMMARY

Theatrical rigging includes equipment assemblies, systems and components required for locating scenic, acoustic, lighting and masking elements in variable vertical planes within the performance space.

A. Section Includes:

- 1. Work in the following space:
 - a. Proscenium Theatre
- 2. Provide systems including:
 - a. Static suspension of battens utilizing existing battens and suspension where possible and indicated in the drawings.
 - b. Fixed speed motorized battens with controls
 - c. Motorized Front of House Lighting Hoists and Local Controls
 - d. Motorized over stage battens and lighting bars with cable and a cable management system
 - e. Performance Traveler Tracks
 - f. House Curtain Traveler Track and Associated Rigging
 - g. Miscellaneous Rigging Equipment
 - h. Cyclorama Drapery
 - Integrated raceway, cable and cable management for power and control for motorized battens nominated for lighting fixtures as shown in the drawings.
- 3. Additional support structures as required to meet the intent of the Contract Documents
- 4. Provision of materials, components, modifications, assemblies, equipment and services as specified herein. These include, but are not limited to:
 - a. Verification of site dimensions and conditions
 - b. Submittals as required by the Contract Documents
 - c. Submission of Shop Drawings performed, signed and sealed by a Professional Engineer experienced in work of similar nature and scope, and licensed to practice by the appropriate governing authority in the state in which the Work is manufactured.
 - Design and engineering of equipment and systems as required by the Contract Documents
 - e. Manufacture of equipment and systems as required by the Contract Documents

- f. Scheduling, sequencing and coordination with other trades
- g. Site supervision of equipment and systems installation specified herein and elsewhere in the Contract Documents
- h. Testing and demonstration of equipment and systems as specified herein and elsewhere in the Contract Documents

- i. Record Drawings and Operations and Maintenance Manuals (O&M)
- j. Instructions to Owner
- 5. Furnish equipment and hardware in addition to the items specified previously that are necessary to provide a fully working system in conformance with the intent of the Contract Documents.
- B. Products Supplied But Not Installed Under This Section NOT USED
- C. Related Sections:
 - 1. Division 5: Metals
 - 2. Division 9: Finishes
 - 3. Division 11: Equipment:
 - a. Section 27 41 16.61: Integrated Audio-Video Systems and Equipment for Theatres
 - 4. Division 26: Electrical:
 - a. Section 26 00 00: Electrical Requirements
 - b. Section 26 61 11: Theatrical Lighting Controls
- D. Allowances Not used
- E. Unit Prices Not used
- F. Measurement Procedures Not used
- G. Payment Procedures Not used
- H. Alternates:
- 1.2 REFERENCES
 - A. American Institute of Steel Construction (AISC) Manual of Steel Construction
 - B. American Welding Society (AWS) Code for Welding
 - C. American National Standards Institute (ANSI)
 - D. American Society for Testing and Materials (ASTM)
 - E. National Electrical Manufacturers Association (NEMA)
 - F. National Fire Protection Association (NFPA) National Electric Code (NEC)

Project No. 234903-20001

G. Underwriters Laboratories (UL)

1.3 DEFINITIONS - NOT USED

1.4 SYSTEM DESCRIPTION

- A. The following establishes minimum safety requirements for the system. Where federal, state and local legislation address these topics, the more stringent requirements shall take precedence. Factors listed below in no way relieve the Contractor from the sole responsibility of providing safe systems.
- B. Performance Requirements:
 - Provide design compliant with ANSI E1.4 Manual Counter Weight Rigging Systems.
 - 2. Provide design compliant with ANSI E1.6-1 Powered Hoist Systems.
 - 3. Provide electrical devices and components that are NEMA and UL approved for the applications. Perform wiring and electrical service by a licensed electrician. Conform to applicable codes.
 - 4. Provide materials that are new, unused, and of the latest design.
 - 5. Minimum design factor for lifted loads: 8:1
 - a. Design factor shall include the effects of static loads, dynamic impact loads, and reductions for end terminations and bending ratios.
 - b. Include dynamic impact loads in the design of all components. The minimum impact factor may be assumed as 33 percent of the static load. Alternately, the Contractor may calculate the impact factor based on the selected hoist components, loads, and hoist speeds. Submit calculations for approval by the Theatre Consultant. The calculations shall include the effect of an emergency stop while lowering the load at maximum speed. In no case may the impact factor be less than 15 percent of the static load.
 - c. Increase the design factor for ropes where normal operating loads include cyclic dynamic loads to suit the system operational requirements for required service life.
 - 6. Minimum design factor for static loads: 6:1
 - 7. Cable bending ratio:
 - a. Manually operated systems: Cable diameter x 26
 - b. Motorized systems: Comply with wire rope manufacturer's minimum recommended bending ratio for the style and grade of wire rope.
 - 8. Maximum Fleet Angle: 1.5 degrees
 - 9. Gear motors: Minimum Class B insulation, totally enclosed fan ventilated (TEFC)
 - 10. Gear motor reducers: AGMA load classification of 1 and minimum mechanical service factor of 1.25
 - 11. Gear motor brakes: Minimum retarding torque equal to 200 percent of the motor full load torque.
 - 12. Bearings: Two (2) times required load at full speed for 2000 hours.
- C. Provide assemblies, cable components, connections, equipment, hardware and linkages employed in supporting, in whole or in part, overhead loads that are rated and designed for that application. Base loading for each component on the maximum percentage of the capacity of the set in which the component is employed. For design purposes, base the minimum set capacity on the batten length multiplied by a thirty (30) pound per linear foot (plf) load unless indicated otherwise herein.

- D. Provide mule blocks, rollers and guides as required to provide proper alignment and maintain allowable fleet angles.
- E. Do not substitute cast iron components for arbor top and bottom members and clamps for attaching loft and head blocks to the support structure.
- F. Provide systems designed to reflect industry standard safeguards and precautions related to normal use of the equipment under ideal operating and loading conditions.

1.5 SUBMITTALS

A. Product Data - Not used

B. Shop Drawings:

- 1. Provide Submittals in accordance with Division 1. Submit in a timely manner, allowing sufficient time for adequate review and possible resubmittal without jeopardizing the project schedule.
- 2. Submit Shop Drawings within ninety (90) days of award of contract.
- 3. Provide complete Submittals. No partial Submittals shall be allowed.
- 4. Drawings will show all information necessary to explain fully the design features, appearance, function, fabrication, installation and use of system components in all phases of operation.
- Make engineering studies, calculations, models, and reports part of the Shop Drawing Submittal.
- Fabrication, installation and erection shall not commence until Shop Drawings have been reviewed and marked by the Theatre Consultant.
- 7. All sheets in the Submittal shall be of the same size.
- 8. Submittal shall have a title sheet listing included sheets.
- 9. Submission of Shop Drawings performed, signed and sealed by a Professional Engineer experienced in work of similar nature and scope, and licensed to practice by the appropriate governing authority in the state in which the Work is manufactured.
- C. Shop Drawings: For fabrication of all draperies.
 - 1. Shop Drawings shall be submitted within ninety (90) days of award of contract.
 - 2. Drawings will show all information necessary to fully explain the design features, appearance, function, fabrication, installation, and use of system components in all phases of operation.
 - 3. Fabrication shall not commence until the Theatre Consultant has approved Shop Drawings.
 - 4. All sheets in the Submittal shall be of the same size.
 - 5. Submittal shall include a title sheet listing all sheets in the Submittal.

D. Samples:

1. Provide labeled samples of components and materials in a reasonable size to serve review process. Provide a minimum of two (2) identical samples for each item requested. Submittal samples shall include, but are not limited to:

- a. Lineset operating/purchase rope
- b. Lineset batten plastic end sleeve

- c. Spot line rope for portable rope rigging
- d. Traveler track operating rope
- e. Cyclorama:
 - i. Provide samples of each type of fabric in the selected colors, including samples matching Architect's sample for custom colors.

E. Quality Assurance/Control - Not used

- 1. Submittals Not used
- 2. Design Data Not used
- 3. Test Reports, Certificates Not used
- Manufacturers' Instructions Not used
- 5. Manufacturers' Field Reports Not used
- 6. Qualification Statements Not used

F. Closeout Submittals:

- Submit Record Documents in accordance with Division 1.
- 2. Bind all O&M (Operations and Maintenance Manuals) documentation separate from general building sections so they can be turned over to the users after approval.
- 3. Provide draft copy of completed manuals for review to the Theatre Consultant before the start of commissioning.
- 4. Operations and Maintenance Manuals, in quantities of three (3), shall include:
 - a. Contact information for Theatre Equipment Contractor and pertinent manufacturers
 - b. Safety and Operational Instructions
 - c. Complete parts and subassembly list
 - d. Equipment design parameters such as safe working loads and duty cycles
 - e. Wiring diagrams and termination schedules
 - f. Periodic Maintenance Schedule
 - g. Maintenance procedures for finishes
 - h. Certificates of compliance with applicable codes
 - i. Records of final testing and log
 - j. Spare parts list and source information
 - k. Warranty documentation
 - I. In addition to the requirements referenced above, provide record copy Shop Drawings for archival and reference usage as part of the O&M manuals:
 - i. Reduced size, 11 inch by 17 inches preferred, hardcopy prints
 - ii. Universal electronic format files, .pdf file type is preferred, as full size printable sheets. Submit files on a USB clearly labeled including project name, project architect, theatre consultant, contractor name, date of submittal.

- 5. Include diagrams depicting the system layout and maximum load limitations (drawn not less than 1/4 inch = 1'-0").
- 6. Provide three (3) hard copies of all Shop Drawings, including any updates or revisions to the original submission.
- Provide the following electronic files:
 - a. Shop Drawings in their native electronic files (AutoCAD or similar)
 - All Submittal files, including Shop Drawings, in a Portable Document File (.pdf) format.
- Certificates of flame-resistance for all fabrics.

1.6 QUALITY ASSURANCE

A. Qualifications:

- Contractor: A firm with a minimum of five (5) years' experience in the type of work required by this Section.
- Installers: Skilled technicians who are thoroughly trained and experienced in the necessary
 crafts and who are completely familiar with the specified requirements and best industry
 practices for the proper installation of the Work.
 - Engage installation supervisors who have satisfactorily passed ETCP Rigging qualification tests for theatre and arena and are currently certified for these activities.

B. Regulatory Requirements:

- 1. Flame-Resistance: Comply with NFPA 701 and applicable local, state, and federal codes.
 - a. Natural fiber fabrics shall be chemically treated at the mill for flame resistance using a non-hydroscopic, non-crystalline, permanent agent in an immersion process. Follow manufacturer's recommendations. Materials submitted showing evidence of sprayed flame-retardant are unacceptable. Flame-resistance shall be effective for not less than two (2) years following the date of installation.
- 2. Inherently flame-resistant (IFR) masking material drapery shall be fabricated from 100 percent Avora, complying with NFPA 701.

C. Certifications:

- 1. Welding Standards: Comply with applicable provisions of AWS D1.1.
 - Engage welders who have satisfactorily passed AWS qualification tests for welding processes involved and are currently certified for these processes.
 - Provide a copy of welding certificates held by welders employed in the fabrication or installation of the Work upon request.

- D. Field Samples -Not used
- E. Mock-ups Not used
- F. Pre-installation Meetings Not used
- 1.7 DELIVERY, STORAGE, AND HANDLING NOT USED
 - A. Packing, Shipping, Handling, and Unloading Not used

- B. Acceptance at Site Not used
- C. Storage and Protection
 - 1. Store draperies in dry, humidity-controlled spaces only.
 - 2. Protect draperies individually in plastic bags or cardboards cartons. Protect additional items with suitable plastic wrap to protect from damage.
- D. Waste Management and Disposal Not used

1.8 PROJECT CONDITIONS

- A. Project Environmental Requirements Not used
- B. Existing Conditions Not used
- C. Field Measurements: Verify all critical dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

1.9 SEQUENCING

- A. Coordinate Work in this section with other trades.
- B. Coordinate with the General Contractor the construction of support and fixings for tracks, hangers and winch assemblies, provision of sleeves for operating lines, access panels, etc.
- Coordinate with Division 26 provision of electrical supplies and conduit for control wiring.

1.10 SCHEDULING - NOT USED

1.11 WARRANTY

A. Special Warranty

- 1. Warrant systems and equipment to be free of defective components, faulty workmanship and improper adjustment for a period of two (2) years from the date of Owner's acceptance. Paint and exterior finishes are excluded relative to failure due to unusual exposure. Replace items showing evidence of defective materials or workmanship (including installation workmanship) within thirty (30) days after notification. Make replacements without cost to the Owner. Rectify conditions that might present a hazard to human life, well-being and or property within forty-eight (48) hours of notification.
- Designate warranties on manufactured equipment to the Owner to commence on the date of system acceptance.

1.12 COMMISSIONING - NOT USED

1.13 MAINTENANCE

A. Extra Materials:

1. Provide the following units as spares to be included in the base bid and turned over to the Owner at the time of system commissioning and training:

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a. Unique test equipment for repair and maintenance of the motive and control systems

2. Replace extra materials that are used during the warranty period so that the complete specified inventory is available throughout the warranty period.

B. Maintenance Service:

1. Provide maintenance service for a period of one (1) year after final acceptance of the installation. This service consists of at least two (2) half-yearly visits to the site for checking and adjusting of equipment. Perform the first visit six (6) months after the system has been accepted. Arrange visit to be at a time mutually agreeable to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide the rigging systems from components (except where otherwise stated) that are the products of one of the following manufacturers:
 - 1. Atlas Silk Division, H&H Specialties Inc., City of Industry, CA
 - 2. J.R. Clancy, Inc., Syracuse, NY
 - 3. ETC Rigging, Middleton, WI
 - 4. Doughty Engineering Limited, Hampshire, UK
 - 5. TAIT/Stage Technologies, Lititz, PA
 - 6. Texas Scenic Company, San Antonio, TX
 - 7. Tiffin Scenic Studios, Inc., Tiffin, OH
 - 8. Thern, Winona, MN
 - Tomcat Staging Inc., Midland, TX
 - 10. Total Structures Inc., Ventura, CA
- B. Provide tracks and operating devices that are products of one of the following manufacturers:

- Atlas Silk Division, H&H Specialties Inc., City of Industry, CA
- 2. Automatic Devices Co. (ADC), Allentown, PA
- 3. Tru-Roll Inc., Monrovia, CA
- C. Provide drapery that are products of one of the following manufacturers:
 - 1. I. Weiss & Son, Fairview, NJ 201-402-6500
 - 2. Rose Brand, Secaucus, NJ 800-223-1624
 - 3. Stage Decoration & Supplies, Inc., Greensboro, NC 888-220-3174
 - 4. Gerriets, Ewing, NJ 609-771-8111
 - 5. Texas Scenic Company, San Antonio, TX 800-292-7490

2.2 EXISTING PRODUCTS - NOT USED

2.3 MATERIALS

- A. Materials shall conform to the following ASTM and ANSI standard specifications:
 - Structural steel shapes and plate: A36
 - 2. Steel tube: A500
 - 3. Malleable iron casting: A47
 - 4. Gray iron casting: A48

B. Fasteners:

- 1. Comply with ANSI B18.2.1&2 Specification for square and hex bolts and nuts.
- 2. Bolts and fasteners shall be grade 5 or better.
- 3. Fasteners shall be rated for the anticipated loads.
- 4. Provide fasteners with approved markings indicating their rating.
- C. Electrical and Control Components:
 - 1. Comply with the requirements of the NFPA National Electric Code.
- D. Fabrics: Employ fabrics of one (1) color from the same dye lot with no split widths or mismatched pieces.
- E. Cyclorama White Celtic Cloth:
 - 1. Material: 100 percent polyester, inherently flame retardant, 6.7 ounces per sq yard.
 - 2. Color: White
 - 3. Accepted Fabric Manufacturers:
 - 4. Celtic Cloth
 - i. Rose Brand, New York, NY 800-223-1624
 - ii. Or approved equal

2.4 MANUFACTURED UNITS

- Sheaves:
 - a. Provide blocks with sheaves as described herein.
 - b. Provide sheaves with rope and cable grooves that conform to rope and cable manufacturers' standards for groove shape and tolerance.

- c. Provide headblock sheaves to operate on precision tapered roller bearings properly sized for the required load and speed. Bore the hub within the close tolerances established by manufacturers engineering data for proper press fit of the cups without need of further cup clamping devices.
- d. Provide loft block sheaves to operate on precision sealed ball bearings properly sized for the required load and speed. Provide tapered roller bearings in high thrust or eccentric loading conditions including on mule blocks and diverter blocks. Provide tapered roller bearings where low noise levels are required.

- e. Machine grooves to be smooth and free of irregularities, tool marks and imperfections. Machine hubs to assure proper bearing alignment.
- f. Cast iron sheaves: Provide from machined cast blanks for all blocks in manual counterweight sets and loft blocks in motorized counterweight sets.
- g. Synthetic sheaves: An acceptable alternate for manual counterweight loft blocks. Provide from either machined extrusion or injection-molded shapes.
- h. Steel sheaves: Provide from machined solid steel blanks for headblocks for all blocks in motorized counterweight sets.
- i. Recognized:
 - i. ASTM A48 Class 30 gray iron
 - ii. Nylatron GS, The Polymer Corporation

2. Blocks:

- a. Provide blocks to be suitable for anticipated loading and required mounting.
- b. Provide blocks with the appropriate sheave as specified herein.
- c. Configure the block so the cable is supported according to wire rope manufacturer's recommendations.
- d. Configure blocks to prevent the hoisting rope from leaving the sheave groove. Provide block design to prevent the hoisting rope from leaving the housing in event of sheave, shaft or bearing failure.
- e. Provide shafts for sheaves of precision-machined cold finished steel sized to accommodate the sheave bearing and load. Employ a key or wire keeper pin to prevent shafts from rotating. Thread the other end of the shaft and provide with locknut.
- f. Provide side plates (cheeks) of steel plate of a cross section required for the anticipated load, but in no instance less than 12 gauge (0.1046 inches). Secure side plates to each other with spacer assemblies each consisting of appropriately sized bolts, nuts, washers and round tube spacers. Arrange spacer assemblies in a configuration to permit anticipated movement of rigging while restraining running lines from escaping sheave grooves. Provide spacers with appropriate tapers and finishes to prevent damage to running lines.
- g. Weld side plates to appropriately sized base angles resulting in a rigid parallel housing for the sheave.
- h. Align each sheave within the block so that the center and sides of the groove rotate in the same axis perpendicular to the axle and parallel to the side plates. Distance between outer face of sheave and inner face of cheek plate shall be less than one cable diameter.
- Cut cheek and draw bolt mountings are not acceptable...
- j. Loft blocks, underhung:
 - i. Provide loft blocks with 8 inch diameter sheaves.
 - ii. Provide loft blocks with steel mounting clips extending the full width of the base angles. Provide clips with an offset to allow for mounting beam flange thickness. Rigidly position each clip with not less than two (2) appropriately sized rated bolt assemblies.
 - iii. Provide blocks that allow positioning of the cable to pass through the grid well at its centerline.

- iv. Provide each underhung block with solid nylon idler sheaves with sealed ball bearings for guiding and supporting running lines at proper elevation and groove quantities related to the headblocks. Solid nylon idlers shall prevent cable from sagging, touching and wearing against other elements.
 - a. Idlers shall be used only where the catenary cable weight is carried.
 - b. Select idler sheaves to have a minimum 3 inch diameter.
 - c. Operate idlers on sealed ball bearings for guiding and supporting running lines at proper elevation and groove quantities related to the head blocks.
 - d. Solid nylon idlers shall prevent cable from sagging, touching and wearing against other elements.
 - e. Idlers must operate quietly at all speeds. Squeaking bearings and/or rubbing idlers will be rejected.

3. Tension blocks:

- a. Provide tension blocks with 12 inch diameter sheaves.
- b. Provide with appropriately sized steel side plates and a kick plate located at the upper on-stage corner.
- c. Provide tension blocks of sufficient weight to maintain constant tension on purchase line.
- d. Configure the block mounting to ride freely in the guide track on two (2) sets of guide shoes of similar arrangement as the associated counterweight arbor. Ensure that the tension block properly engages track and remains in set location while purchase line is under tension.
- It shall be possible to adjust the rope tension easily by using the toe kick plate and the hand line.

4. Lift lines:

- a. Determine the diameter and classification of wire rope construction to suit the system operational requirements. Minimum standard for overhead lifting: wire rope classification of 7 by 19 IWRC.
- b. Employ continuous lines from the same spool/length, free of knots, splices or mechanical fasteners along their length unless specifically required otherwise in the Contract Documents. Do not employ damaged or deformed cables.

5. Batten connections:

- a. Provide bright finish passing link trim chains, minimum 1/4 inch proof coil chain, 42 inches long with one (1) end installed on the batten end eye of each lift line.
- Provide one (1) loose pin chain shackle at lift line eye for the chain and load per trim chain.

6. Pipe battens:

- a. Provide static pipe battens of 1-1/2 inch nominal Schedule 40 seamless black wrought steel pipe. Provide electric battens as Schedule 10. Join batten sections with 24 inch long by 1-9/16 inch D.O.M. steel tube splice sleeve extending 12 inches into each pipe and held by two (2) 3/8 inch hex bolts and lock jam nuts on each side of the joint.
- b. Provide pipe battens clean and free from mill finishes, scale and rust, and painted black.
- c. Provide battens in the length(s) depicted on the Drawings. Incorporate full pipe sections for each batten with only one partial section located on centerline.

- d. Appropriately number each batten on both ends as to be read from above and below.
- e. Mark battens with a painted white stripe 1 inch wide running around the full circumference and at the proper lift line attachment points. Paint the end of each pipe white with a 1'-0" wide stripe from the ends toward the midpoint..

B. Motorized Rigging Systems:

General:

- a. Provide system designed for the fixed or variable speeds as specified herein.
- b. Verify all dimensions and mounting requirements necessary to complete the Work. Provide all secondary supporting steel work as necessary.
- c. Brake/motor/gear unit to be from single manufacturer and to be generously sized for application.
- d. Brakes shall be spring applied and electrically released. Brake shall apply a minimum retarding torque equal to 200 percent of motor full load torque.
- e. Provide electric gear motors coupled to a minimum 12 inch diameter helical grooved cable drums to provide for wire rope lift lines in one layer wrap as indicated on the Drawings.
- f. Provide motors with high inertia brake fans unless otherwise noted.
- g. Winch duty cycle to be a minimum of five (5) complete cycles followed by thirty (30) minutes rest.
- h. Provide the hoist on an integrated frame, completely enclosed with appropriate drip pans and access panels for maintenance. Enclosure shall not interfere with the operation of the hoist or any other system.
- i. Winch unit shall operate smoothly and quietly without any rattles, squeaks, or vibration apparent at any time.
- All transmission couplings from motor unit through to drums to be keyed and of ample torque capacity.
- k. Transmission couplings and bearings shall be self-aligning type to address installation and field conditions.
- I. Base mounting frame to be of substantial and rigid steel construction, with suitable provision for fixing to building framing.
- m. Confirm that methods of anchoring and loads are acceptable to project Structural Engineer.
- Provide and install all auxiliary mounting steel, attachments, hangers, bracing and anchors to attach the dual Lift lines to structure.
- Winch unit to be completely pre-assembled and pre-wired in factory and tested before delivery to site.
- p. Guard all moving or vulnerable parts of winch. Provide guards of sufficient strength to withstand everyday abuse, including standing or sitting on, without damage or deformation. Guards shall not interfere with operation of winch unit. Guards shall not rattle or vibrate. Attach guards securely, but ensure they are readily removable for maintenance purposes. Guard shall have no sharp corners or edges.
- q. Provide 12 inch diameter lift line loft blocks attached to structure as indicated in the Drawings.

- r. Provide 8 inch diameter lift line mule blocks attached to structure as indicated in the Drawings.
- s. Determine the diameter and classification of wire rope construction to suit the lift line operational requirements.
- t. Employ continuous lines from the same spool/length, free of knots, splices or mechanical fasteners along their length unless specifically required otherwise in the Contract Documents. Do not employ damaged or deformed cables.

2. General Controls:

- a. Unless otherwise noted, control and monitoring shall be accomplished with devices that are factory pre-wired and mounted on the winch base frame. Provide control and monitoring equipment local to the winch to ensure that it will meet the performance criteria stated herein and in Section 11 61 35 Theatrical Equipment Controls.
 - i. Provide Control devices; fixed speed motor starters, variable speed frequency drives, and vector drives, brake contactors, line contactors, and other devices as indicated. Control devices shall respond to output signals.
 - ii. Provide Feedback devices; Limit Switches, Positioning devices, Brake Status, and other devices as indicated. Feedback devices shall send input signals.
 - iii. Provide Alarm signals; Under Voltage, Over voltage, Over Current, Over Temperature, Phase Loss/Reversal, Cross Groove, Slack Line, Overtravel, Encoder Fault. Control Fault, and other faults as indicated. Faults shall send alarm signals.
 - iv. Provide suitable junction boxes, terminal strips, and other related hardware for connection of wires to carry these signals.
 - v. Refer to Section 11 61 35 for Input, Output, and Alarm signals for each device. Coordinate with Section 11 61 35 the type, voltage, and state of all signals.
 - vi. Provide additional equipment as required to meet the intent of the Contract Documents. Coordinate with Section 11 61 35 Theatrical Equipment Controls for any additional signals to be sent or received by the equipment.
- b. Where indicated, or where specific equipment design precludes the mounting of control and/or monitoring devices to the base frame, such as direct strike limit switches, run all remote signals back to the primary control and monitoring location for each piece of equipment, such that there is one point of interface between each winch or group of winches and the performance control in system.
- c. Provide local controls for use in installation, service and maintenance.
 - Provide control operators as part of motor starter or drive cabinets mounted to base frames.
 - ii. Provide "Local"/"Remote" key switch.
 - iii. Provide deadman style pushbuttons for each direction of movement. Label each button to clearly indicate its function.

d. Local mode limit devices:

- These devices shall function in both Local and Remote modes, regardless of the status of the Performance Control System.
- ii. Provide end of travel limits for all devices. Utilize rotary limits unless otherwise noted.
- iii. Provide overtravel limits for all devices. Utilize rotary limits unless otherwise noted. Configure overtravel limits to open a line contactor in the machine's motor controller.

- iv. Where several devices are to be moved sequentially, provide enabling limits to permit motion only in the prescribed sequence and ranges.
- e. Rotary limit switches: Provide heavy-duty rotary limit switches coupled to the output shaft of the reducer. Key and pin roller chain sprockets and shaft couplings to shafts. Provide removable covers and chain guards on all limit switch assemblies.
- f. Direct strike limit switches: Provide heavy-duty normally closed type limit switches securely mounted
- g. Slack line detectors: Provide heavy-duty normally closed type limit switches triggered by a deflector arm set on a lift line. Provide adjustment in deflector arm to allow for adjustment in the degree of slack that will trigger the switch and eliminate nuisance tripping.
- h. Provide motor control cabinets with safety disconnects adjacent to electric gear motors or as indicated in the Drawings.
- i. All key switches shall be unique with the option for master key enabling.
- j. Pantograph:
 - i. Provide complete system of customized extruded aluminum wireway containing five cable compartments.
 - ii. Provide hinge sections and horizontal stabilizing track with trolley to safely service the truss in all of its elevations.
 - iii. Provide ceiling mounted junction box. Coordinate size and requirements with another Section.
 - iv. Dimming and control cables by other Section.
 - v. Precisely match the clamping devices to the truss top chord.
 - vi. Finish: electrostatic black

3. Hoist Power And Control Cables:

a. Each Drive Section shall include a power cord and Cat 5e (or better) hard-wired to the hoist with bare ends for field termination. Inclusion of a 20 amp 3-phase breaker in the junction box is optional. If the power and control cables terminate in the same enclosure, the wiring and optional connectors shall be incorporate a barrier between high and low voltage components. Proper strain relief at the Drive Section shall be provided.

4. Cable Management

- a. Supplied motor power and control wiring shall be fed to the motor control enclosure by multi-conductor SO cable and Cat 5e (or better) cable. Each cable shall be held in place at the enclosure by means of a dedicated strain relief assembly.
- b. Lighting circuits and data wiring shall be fed to a standard raceway as shown in TL series drawings by multi-conductor SO cable. The SO cable shall be held in place at both ends by means of a dedicated strain relief assembly.

5. Power And Control Distribution

- a. The hoist and hoist cable management system shall allow for the attachment of a dedicated circuit and data distribution raceway.
- b. The power/distribution raceway shall be UL Listed for this application.
- c. Basis of Design:
 - i. Fly Pipe, Electronic Theatre Controls (ETC) Inc, Middleton, WI

C. Traveler Tracks:

- 1. Tracks and accessories shall be provided from one manufacturer.
- 2. Provide the tracks from heavy-duty channel type track constructed of 14 gauge steel formed to provide parallel double tracks for carrier wheels. Except for the bottom carrier slot, the track shall be totally enclosed.
- 3. Provide each track assembly from as few pieces as possible, free of burrs, dents and irregularities. Do not exceed 7'-0" on center for the maximum spacing of manufacturer's hanger supports.
- 4. Provide the house curtain traveler track assembly of sufficient length to allow the curtain to travel clear of the maximum proscenium opening.
- 5. Provide the house curtain traveler track assembly on a single factory supplied backbone with an overlap that shall be achieved at the track without the use of a secondary backbone pipe or overlap master carriers.
- 6. Provide two (2) master carriers for each double-section of track. Provide each carrier with four (4) neoprene wheels fitted with ball bearings and paired so that two wheels ride in the track on either side of the carrier slot. Provide each carrier with two (2) clamps for attachment of 1/2inch operating cord and two plated swivels with a 6 inch trim chain for curtain attachment.
- 7. Provide single carriers with two (2) neoprene ball bearing wheels and a "hollow center" design to bypass the 1/2-inch operating line and prevent operating line sag. Provide carriers with single plated swivels with 6 inch trim chains. Provide one (1) single carrier for each 1'-0" of track length.
- Provide tracks with end stacking (rear fold, back pack) devices to prevent on-stage "bunching" and provide drapery stacking only at offstage track ends.
- 9. Provide heavy-duty type end pulley blocks with 6 inch diameter sheaves turned and grooved to fit the 1/2-inch operating cord and fitted with sealed ball bearings. Provide blocks to retain the operating cord in sheave grooves. Provide double vertical sheaves on the live end of tracks and a single horizontal sheave on the dead end.
- 10. Secure housings to the track with bolts and locking washers.
- 11. Provide end stops and operating cord supports at the overlapping track ends to positively stop master carrier movement when the curtain is closed. Secure stops to the tracks, and provide with rubber bumpers to reduce "stop noise."
- 12. Provide a floor pulley block with a 6 inch diameter sheave. Slot the side plates of the floor block to permit vertical adjustment of the sheave to remove up to 14 inches of slack in the operating line. Provide block with a locking handle to permit sheave adjustment without wrenches or other tools. Incorporate vinyl sand filled base to tension the block when track is raised and lowered.
- 13. Provide tracks, carriers, and other components as supplied from the manufacturer with a black finish on parts and accessories. Bright or natural finish on metal components will not be accepted.
- 14. Provide hardware not specified above but required to provide a properly operating system in accordance with the intent of the Contract Documents.

- 15. Acceptable:
 - a. House curtain traveler track:
 - Atlas Silk #1018 series track (black)
 - b. Stage traveler track:

- i. Atlas Silk #400B series track (black)
- ii. ADC #280 series track (custom black) Automatic Devices Co. (ADC), Allentown, PA 800-360-2321

16. Safety barrier strap:

- a. Provide a 2 inch wide nylon webbing safety barrier strap across the proscenium opening. The device shall be easily positioned, tensioned and removed at the upstage side of the fire safety curtain smoke pocket steel when the orchestra lift is being used.
- b. Color: Safety yellow

2.5 EQUIPMENT - NOT USED

2.6 COMPONENTS

A. Clips, Wire Rope:

1. Size forged "U"-bolt wire rope clips (Crosby clips) appropriately for the cable construction, diameter and lay of the cable with which they are employed.

B. Compression Sleeves:

1. Size compression sleeves appropriately for the cable construction and diameter of the cable with which they are employed.

C. Eyebolts:

 Size eyebolts for the intended application. Employ dropped forged steel shoulder pattern eyebolts.

D. Shackles:

- 1. Size loose pin shackles appropriately for the intended application. Execute chain connections with chain shackles; other connections may employ anchor shackles.
- Size the screw pins where required to insure that the threads are not included in the bearing surface of the bolt.

E. Thimbles, Wire Rope:

1. Size wire rope thimbles appropriately for the cable construction and diameter of the cable with which they are employed.

F. Thimbles, Manila/Fibrous and Synthetic Rope:

1. Size appropriately for the rope construction and diameter of the rope with which they are employed.

G. Turnbuckles:

1. Size turnbuckles appropriately for the cable construction and diameter of the cable with which they are employed. Provide jaw-jaw with safety bolt clevis pin.

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H. Webbing:

3 inch wide nylon or polyester webbing.

I. Grommets:

- 1. Number 2 black metal washer grommets unless otherwise noted.
- J. Chain Weights:
 - Zinc plated #8 jack chain sewn into muslin sleeve.

2.7 ACCESSORIES

- A. Tie Lines: Solid braided black "venetian blind" or mason cord NO 4-1/2 (9/64-inch diameter)
- 2.8 MIXES NOT USED
- 2.9 FABRICATION NOT USED
 - A. Shop Assembly Not used
 - B. Fabrication Tolerances Not used

C. General:

- 1. Fabric shall be inspected for weaving flaws and imperfections prior to fabrication.
- 2. Unless specified otherwise herein, sew fabrics with nylon filament thread. Employ matching thread throughout.
- 3. Unless otherwise specified, sew drapes pile up.
- 4. Construct drapery with the center of the center panel of fabric on the centerline of the drape. Legs shall be sewn with full widths only.
- 5. Fabricate drapery panels to run the height of the various sections without horizontal seams. Fabric nap or pile must run in the same direction, unless otherwise specified.
- 6. Locate grommets in the center of the webbing width so no horizontal stitching is cut or severed. Locate grommets on 1'-0" centers.
- 7. Double grommet the upper corners of each masking section so that either panel may be used stage left or stage right.
- 8. Fabricate so that the bottom edge of the face fabric and lining is within 1/4 inch parallel with the top edge of the drapery, for true hanging across full width.
- 9. Provide a fire test strip 24 inches long from the face material sewn into one turnback or side hem.

D. Cyclorama:

- 1. Fabricate the scrim from seamless panels of Celtic Cloth finished to the dimensions indicated in the Schedule.
- Fabricate the cyclorama from panels of Celtic Cloth finished to the dimensions indicated in the Schedule.
- 3. Reinforce the top with webbing. Provide zinc plated grommets 12 inches OC and double grommets at both ends.

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4. Finish the bottom with a 4 inch hem. Include a cotton duck pocket for a 3/4 inch nominal pipe batten, stitched to the top of the hem so as to position the batten 1 inch above the bottom of the scrim. Size pocket to allow easy insertion and removal of a bottom pipe batten of up to 1 inch nominal pipe.

- 5. Finish the sides with a 2 inch double turned hem with 3/8 inch stretcher cord inserted within. Reinforce eyelets where stretcher cord exits seam
- 6. Secure to batten with black 36 inch NO 4 black cotton tie lines.

E. Signage:

- Mark the centerline of the webbing with indelible marker. Use a white tie line on the centerline grommet.
- 2. Sew a white fabric label on the upper right and left corners of the webbing of the drape with the following information in the following formats. The label shall be no smaller than 3 inches by 6 inches and in no cases should the text size be smaller than 1/8 inch high.
 - a. For draperies sewn from material that is flame proofed:

ITEM NAME:					
ITEM NUMBER:					
DIMENSIONS: FULLNESS:					
DATE OF MANUFACTURE:					
DATES OF FLAMEPROOFING:////					
MANUFACTURED BY:					
THEATRE CONSULTANT: THEATRE PROJECTS					
b. For draperies sewn from inherently flame-resistant (IFR) material:					
ITEM NAME:					
ITEM NUMBER:					
DIMENSIONS: FULLNESS:					
DATE OF MANUFACTURE:					
MANUFACTURED FROM INHERENTLY FLAME-RESISTANT MATERIALS MEETING					
NFPA 701,					
MANUFACTURED BY:					
THEATRE CONSULTANT: THEATRE PROJECTS					

 List compliance of IFR materials with NFPA 701 and applicable local, state, and federal codes.

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3. Label one bottom corner with flame-proofing information for code official.

2.10 FINISHES

- A. Shop Priming Not used
- B. Shop Finishing Not used
- C. Lock Rail and Locks: Black.
- D. Steel Guide Track and Associated Hardware: Black
- E. Counterweight arbors: Black.

Dobbs Ferry UFSD Middle School / High School

- F. "Pipe Weight" on Each Set: Safety yellow
- G. Index Strip Light Exterior: Black semi-gloss
- H. Index Strip Light Interior: White
- I. Winch Motors and Frames: Gray

J. Signage:

- 1. Provide signage legible in construction and grammar. Sign surfaces and characters shall be textured or otherwise treated to minimize glare and veiling reflectance.
- 2. Provide an engraved black lamacoid plaque, with white 3/8 inch characters next to the loading diagrams at stage and loading gallery elevations. List on the plaque the standard size of counterweights provided and their respective weights. Engrave a warning on the plaque cautioning against unauthorized and untrained personnel operating the rigging system.

2.11 SOURCE QUALITY CONTROL

- A. Tests, Inspection Not used
- B. Verification of Performance Not used
- C. Work on the systems may be reviewed at the point of manufacture a minimum of one time during fabrication. This review will occur during the final factory checkout prior to shipping, unless the Manufacturer and Architect agree on a more advantageous inspection date.

PART 3 - EXECUTION

3.1 INSTALLERS - NOT USED

3.2 EXAMINATION

- A. Examine drawings and confirm that number, size and location of conduit are adequate for proposed system.
- B. Inspection of components of the Work to ensure no damage has occurred during shipping or storage.

C. Site Verifications of Conditions:

- 1. At earliest opportunity, the Contractor shall inspect all the spaces where theatre equipment components are to be installed. The Contractor shall ensure that no obstacles exist which might prevent proper installation, preclude the smooth operation of mechanisms or cause wear and tear to installed systems.
- 2. Survey all relevant areas and verify dimensions. If requested, make whatever modifications are deemed necessary to the theatre equipment components.
- 3. Examine work prepared by others to receive work of this Section. Commencement of the work shall be construed as complete acceptance of preparatory work by others. The inspection includes but is not limited to:

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a. Ensure mounting surfaces are ready to accept the Work.

b. Verify mounting conditions are flat, plumb, and level.

D. Discrepancies:

- 1. In the event of discrepancies, immediately notify the Theatre Consultant.
- 2. Do not proceed with the installation in areas of discrepancy until all such discrepancies have been fully resolved.
- 3. Commencement of Work shall indicate an acceptance of existing conditions.

3.3 PREPARATION

- A. Protection Not used
- B. Verify field measurements at the site prior to installation and modify the system accordingly.
 - 1. Deliver equipment to the site only after the building has been closed in. Coordinate storage at the site and ensure the materials and components are undamaged.
 - 2. Protect the surrounding environment from damage by the Work.

C. Surface Preparation:

Clean surfaces as necessary prior to commencing the Work.

3.4 ERECTION, INSTALLATION AND APPLICATION CONSTRUCTION

- A. Special Techniques Not used
- B. Interface with Other Work Not used
- C. Sequences of Operation Not used
- D. Site Tolerances Not used

E. General:

- 1. Trim sets to provide horizontal track and batten set-up.
- 2. Mouse turnbuckles and shackles with a malleable wire after adjustment.
- 3. Align the center of each batten with the centerline of the proscenium opening.
- 4. Rig the counterweight system to allow battens to reach the maximum height above the stage floor based on arbor travel and an average low trim of 4'-0" above the finished floor.
- 5. Rig other loads as specified in the Contract Documents.

F. Block Connection:

- 1. Align blocks as required by the Drawings and accompanying schedules. Conform alignment to the requirements set forth herein.
- 2. Secure blocks as per accepted mounting design. Where connection device contact is not uniform, employ steel shims. Perform mounting to insure blocks are securely attached to the support structure and are immobile except by intentional user action.
- 3. Configure underhung loft block alignment to use the idler sheaves in logical sequence.

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4. Weld motorized set components after final alignment.

G. Hoisting Rope Connections:

- 1. Employ rope fastenings that develop not less than 75 percent of the manufacturer's rated breaking strength of the rope employed.
- 2. Employ one continuous length of cable for each lift line. The lengthening, joining or repairing of two or more sections of wire rope is prohibited. Mid-line splices are unacceptable.
- 3. Provide compression style fittings on all line set lift lines.
- 4. Align loads on pins via steel spacing washers to assure even loading. After closing the shackle, reform the cotter pin at the end to prevent unintentional loosening of the pin.
- Secure the lift lines to the typical arbor tops by employing eyes and shackles. Form the eye as described herein.
- 6. Where permitted, make cable connections with wire rope clips according to manufacturer's application instructions.
- 7. Employ clips of the proper lay for the cable used. After initial loading, suspend a load equal to the anticipated load from the clip eye for twenty-four (24) hours, and then re-tighten the clips.

H. Theatrical Drapery:

1. Install theatrical drapery on linesets as indicated in the Drawings.

I. Motorized Rigging Installation:

- 1. Install all local controls including motor control/starter cabinets, limits, and positioning devices. Coordinate with Division 26 for connection to fixed disconnects and other power sources.
- 2. When the equipment is ready to receive wiring from the Performance Equipment Control System, coordinate with Section 11 61 35 Theatrical Equipment Controls and Division 26.
- Index strip lights:
 - a. Suspend fixtures level and perpendicular to the proscenium wall, and to in no way interfere with the systems and equipment referred to in this Contract.
 - b. Locate the fixtures illuminating the lockrail as shown on the Drawings.

4. Signage:

a. Install signage as described in the Contract Documents.

3.5 REPAIR/RESTORATION - NOT USED

3.6 RE-INSTALLATION - NOT USED

3.7 FIELD QUALITY CONTROL

A. Inspection:

- 1. During the installation of equipment, the Contractor shall arrange for safe access as necessary for inspection of equipment by the Architect.
- 2. Repair or replace any equipment that fails to meet with the Specifications with suitable equipment prior to testing and final inspection.
- 3. At the time of these inspections, remove all temporary bracing, scaffolding, etc. to permit full operation of and access to all equipment.

B. Site Testing:

- Provide fourteen (14) days' notice of all tests so that the Theatre Consultant may witness such tests.
- 2. Clearly record the date, time, details and results of all the following tests and demonstrations and any subsequent re-tests. This will form the start of a system logbook to be handed over to the user after acceptance together with operation and maintenance manuals.

3. General:

- a. Inspect the completely assembled system including all mechanisms, fittings, control panels, etc., and make good all deficiencies.
- b. Demonstrate compliance with tolerances specified in the Contract Documents.
- c. Inspect draperies and make good deficiencies before declaring the system is complete.

4. Load test:

- a. Submit proposal for test weight for review by Architect.
- b. Provide weights for the duration of the tests and any subsequent re-testing.
- c. Provide verification that the correct test loads are provided.
- Load each motorized lineset with distributed weights equivalent to 110 percent specified static load.
- e. Demonstrate motion with full specified dynamic payload.
- f. Verify speed, noise and stability compliance with the Contract Documents.
- With each motorized lineset fully loaded for dynamic testing, perform motor current checks.
- h. Comprehensively verify the accuracy of positioning of each motorized lineset approached from both directions to each preset position.
- 5. Provide demonstration and testing as required to obtain certification that may be required by the Authority Having Jurisdiction. This Contractor is solely responsible for obtaining such certification and all costs arising there from. Certification is a condition of final payment.

6. Final inspection:

- a. Final review will be made by the Theatre Consultant following written notice from the Contractor that the installation is complete.
- b. At the time of inspection, furnish sufficient workers to operate all equipment and to perform such adjustments and tests as may be required by the Architect. Repair or replace any equipment that fails to meet with the specifications with suitable equipment. The inspection shall be rescheduled under the same conditions as previously specified.
- c. At the time of these inspections, no other work shall be performed in the auditorium and stage areas. Remove all temporary bracing, scaffolding, etc. to permit full operation of and access to all equipment.
- d. Drapery which fails to meet with the specifications shall be repaired or replaced with suitable drapery prior to Site Tests and Final Inspection.

- C. Manufacturers' Field Services Not used
- 3.8 ADJUSTING NOT USED

3.9 CLEANING

- A. Provide clean up, including removal of packing materials, construction debris, etc., resulting from the execution of the Work.
- B. Protect surfaces or equipment provided by other sections. Clean and repair any damage to portions of the Work during the execution of the Work.
- C. Protect surfaces or equipment provided by this section. Coordinate to insure that the Work is not damaged during subsequent installations by other trades.

3.10 DEMONSTRATION

A. Demonstrate system operation and instruct the Owner in the proper use, care, and maintenance of all items.

B. Training:

1. Provide a total of twenty (20) hours of training to the Owner on use and maintenance of this equipment after the systems have been commissioned and accepted as satisfactory. These sessions are to consist of no fewer than five (5) four-hour periods.

3.11 PROTECTION

- A. Provide protection for all materials and equipment provided by this section against damage by dirt, paint, damp, and physical abuse until system is accepted and handed over to Owner. This includes providing purpose-made covers that shall be temporarily removed to allow testing and commissioning of the system.
- B. Coordinate to ensure that the Work is not damaged during subsequent installations by other trades.

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C. This Work will only be accepted in "as new" condition.

3.12 SCHEDULES - NOT USED

END OF SECTION 11 61 33 THEATRE PROJECTS CONSULTANTS, INC. COPYRIGHT© 2020

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PART 1 - GENERAL

1.1 SUMMARY

A. This section includes Theatrical Lighting Instruments and Accessories used on the stage and in front of house lighting positions for the illumination of the performance areas.

B. Section Includes:

- 1. Work in this section includes manufacture, furnishing and installation of theatrical lighting instruments and accessories for the following spaces:
 - a. Proscenium Theatre
- 2. Scope of work includes:
 - Furnish and install compliment of fixtures and accessories specified herein and shown in the light plot.
 - b. Signal and power cable for motorized electrics is part of Division 11 61 33 specification.
- 3. Section includes materials, components, modifications, assemblies, equipment and services as specified herein, including but not limited to:
 - a. LED stage lighting instruments
 - Ellipsoidal fixtures
 - ii. PAR/Wash fixtures
 - iii. Cyc/strip fixtures
 - b. Followspots
 - c. Stage lighting accessories
 - i. Top hats
 - ii. Half hats
 - iii. Donuts
 - iv. Template holders
 - v. Barndoors
 - vi. Egg crate louvers
 - vii. Hanging trunions
 - viii. Mounting pipes and connectors
 - d. Loose electrical distribution
 - i. Jumper cables
 - ii. Multicables
 - iii. Breakouts, Break-ins, and adaptors
 - iv. Portable power and signal distribution
 - e. Data cable, fixture assembly and removal and disposal of packing materials.

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f. Installation and focus of fixtures specified herein based on the light plot in the drawings.

- 4. Furnish equipment and hardware in addition to the items specified previously that are necessary to provide a fully working system in conformance with the intent of the Contract Documents.
- C. Products Supplied But Not Installed Under This Section:
- D. Related Sections:
 - 1. Drawings and general provisions of the Contract apply to this Section, including General and Supplemental Conditions and Division 1 Specification Sections.
 - 2. Division 11: Equipment:
 - a. Section 11 61 33: Theatrical Rigging
 - b. Section 11 61 13: Orchestra Enclosures
 - 3. Division 26: Electrical
 - a. Section 26 61 11: Theatrical Lighting Controls
- E. Allowances:
 - 1. TBD
- F. Unit Prices:
 - 1. Provide unit prices for each line item in the Equipment Schedule in Part 3 of this section.
 - 2. Provide labor pricing for hang and focus of light plots, broken down by theatre.
- G. Alternates:
 - 1. This section includes Alternates.

1.2 REFERENCES

- A. Reference Standards:
 - 1. Underwriters Laboratories Standards:
 - a. UL498, Electrical Attachment Plugs and Receptacles
 - b. UL1573, Stage and Studio Lighting Units
 - 2. ANSI Standards:
 - E1.11 2008 (R2018) Entertainment Technology USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories
 - b. E1.17-2015 Entertainment Technology Architecture for Control Networks
 - E1.20-2010 Entertainment technology Remote Device Management over DMX512 Networks
 - E1.27-1-2006 (R2016) Entertainment Technology Standard for Portable Control Cables for use with DMX 512/1990 and E1.11 (DMX 512-A) Products
 - e. E1.31-2018 Entertainment Technology Lightweight streaming protocol for transport of DMX512 using CAN

3. Institute of Electrical and Electronics Engineers, Inc.:

a. Standard: 802.3

b. Standard: 802.11 b or g

4. National Electric Code

5. American National Standards Institute

6. International Building Code

1.3 DEFINITIONS

A. AHJ: Authority Having Jurisdiction

B. DMX: Digital Multiplexing

C. NEC: National Electric Code

D. PC: Neutrik powerCON connector

E. UL: Underwriters Laboratories, Inc.

F. USITT: United States Institute for Theatre Technology, Inc.

G. ESTA: Entertainment Services and Technology Association

H. FURNISH: Deliver and hand over to others for installation, deliver complete with related

accessories

I. INSTALL: Set in place and connect

J. PROVIDE: Furnish and install

1.4 SUBMITTALS

A. Provide submittals in accordance with Division 1. Submit submittals in a timely manner, allowing sufficient time for adequate review and possible resubmittal without jeopardizing the project schedule.

B. Product Data:

1. Provide a list of all items to be furnished with manufacturer's catalog numbers for each item.

C. Shop Drawings:

- Drawings and Catalog Cuts shall show all information necessary to explain fully the design features, appearance, function, fabrication, installation and use of system components in all phases of operation.
- Fabrication shall not commence until the Theatre Consultant has approved shop drawings.
- 3. All sheets in the submittal shall be of the same size.
- 4. Submittal shall include a title sheet listing all sheets in the submittal.
- 5. Submittal shall include a complete Bill of Materials showing all items being supplied by the manufacturer and or supplier.

- 6. Submit with bid the following time estimates:
 - a. Length of time required to furnish all equipment
 - b. Length of time to install and focus the light plot

D. Commissioning:

1. Provide draft copy of completed manuals to the Theatre Consultant before the start of commissioning for use during commissioning.

E. Closeout Submittals:

- 1. Organize operating and maintenance manuals into suitable sets of manageable size.
- 2. Bind data into individual binders for each manual, properly identified on front and spine. For large manuals, provide and index sheet and thumb tabs for separate information categories.
- 3. Provide heavy-duty three-ring vinyl-covered binders, 1 inch to 2 inch thick as required to contain information, sized for 8-1/2 inch by 11 inch paper with inside pockets or pocket folders for folded sheets.
- 4. Operations and Maintenance Manuals (O&M) shall include:
 - Contact information for Theatre Performance Lighting Instruments and pertinent manufacturers
 - b. Safety and Operational Instructions
 - c. Complete parts and subassembly list
 - d. Wiring diagrams
 - e. Periodic Maintenance Schedule
 - f. A maintenance procedure for finishes
 - g. Records of final testing and log
 - h. Spare parts list and source information
 - i. Warranty documentation
- 5. Bind all O&M documentation separate from general building sections, so they can be turned over to the users after approval.
- 6. Provide three (3) hard copies of shop drawings, including updates or revisions to the original submission, to accurately reflect the installed system.
- 7. Provide three (3) copies of the following electronic files:
 - a. Final shop drawings in their native electronic files (AutoCAD or similar)
 - Submittal files, including shop drawings, in a Portable Document File (.pdf) format
- 8. Submit files on standard PC format USB clearly labeled including project name, Project Architect, Theatre Consultant, Contractor name, and date of Submittal.

1.5 QUALITY ASSURANCE

A. Qualifications:

 Source: To the extent permitted by the product specifications, provide products and accessory components of one manufacturer for each instrument type required for the work of this section.

- 2. Contractor: A firm with a minimum of five (5) years' experience in the type of work required by this section.
- 3. Installers: Skilled technicians who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and best industry practices for the proper installation of the work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading:
 - 1. Deliver stage lighting instruments, cable and accessories securely wrapped in factory fabricated wooden or fiberboard type containers.
 - 2. Handle equipment being furnished carefully to prevent breakage, denting and scoring finish.
 - 3. Do not install or provide damaged equipment; replace and return damaged units to equipment manufacturer.

B. Acceptance at Site:

1. Contractor shall accept and inventory all equipment upon delivery and provide copies to the Architect and Theatre Consultant.

C. Storage and Protection:

- Store stage lighting equipment in clean dry spaces. Store in original cartons or on battens as directed by the Owner and protect from dirt, physical damage, weather, and construction traffic.
- 2. All equipment shall be stored in a secure, environmentally controlled location. No equipment shall be installed in its location until that location is substantially completed, free from construction dust, and "broom clean".
- 3. Installed lighting shall be protected from construction dust and debris.

D. Waste Management and Disposal:

1. All packing material shall be disposed of by the Contractor.

1.7 SEQUENCING

A. All non-installed Performance Lighting Fixtures and Accessories shall be turned over to the Owner at the time of Theatrical Dimming System acceptance, or at a time previous which is mutually acceptable.

1.8 SCHEDULING - NOT USED

1.9 WARRANTY

A. Special Warranty:

- 1. Warrant fixtures and equipment to be free of defective components or faulty workmanship for a period of one (1) year from the date of acceptance.
- 2. Replace items showing evidence of defective materials or workmanship (including installation workmanship) within thirty (30) days after notification. Make replacements without cost to the Owner.

- 3. Designate warranties on manufactured equipment to the Owner on the date of acceptance.
- 4. Fixtures shall be warrantied for three (3) years.
- 5. Lumen maintenance at 50,000 hours shall be L70 B50.
- 6. Provide cost with bid for additional warranty per year following the three (3) year warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following are recognized system manufacturers for lighting instruments and accessories:
 - 1. AC Lighting: Toronto, Ontario (416) 255-9494
 - 2. Altman Stage Lighting Company: Yonkers, NY (914) 476-7987
 - 3. ARRI Inc: Blauvelt, NY (845) 353-1400
 - 4. Chauvet Lighting: Sunrise, FL (800) 762-1084
 - 5. Electronic Theater Controls: Middleton, WI (608) 831-4116
 - 6. Martin: Northridge, CA (800) 222-0193
 - 7. Signify Lighting: Dallas, TX (214) 647-7919
 - 8. Robert Juliat: ACT Lighting, Hackensack, NJ (201) 996-0884
- B. The following are recognized manufacturers for lighting accessories:
 - 1. City Theatrical, Inc.: Carlstadt, NJ (800) 230-9497
 - 2. The Light Source: Charlotte, NC (704) 504-8399
 - 3. TMB Associates: San Fernando, CA (818) 899-8818
 - 4. Doug Fleenor Designs: Arroyo Grande, CA (805) 481- 9599
 - 5. Pathway Connectivity: Calgary, Alberta, Canada (403) 243-8110
 - 6. Lex Products: Shelton, CT (800) 643-4460
- C. The following are recognized manufacturers for followspots:
 - 1. Altman Stage Lighting Co.: Yonkers, NY (914) 476-7987
 - 2. Lycian Stage Lighting: Sugar Loaf, NY (845) 469-2285
 - 3. Strong Lighting: Omaha, NE (800) 424-1215
 - 4. Canto USA: Marietta, GA (888) 252-5912
 - 5. Robert Juliat: ACT Lighting, Hackensack, NJ (201) 996-0884
- D. The following are recognized manufacturers for automated fixtures:
 - 1. Electronic Theater Controls: Middleton, WI (608) 831-4116
 - 2. High End Systems: Austin TX (512) 836-2242
 - 3. Martin Professional, Inc.: Las Vegas, NV (702) 597-3030

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4. Robe Lighting Inc: Davie, FL - (954) 680-1901

5. Vari*Lite, Inc.: Dallas, TX - (214) 647-7880

E. Lamps:

- General Electric
- 2. Osram Sylvania
- 3. Phillips
- 4. Ushio

F. Accessories Equipment:

- 1. SSRC: Duncan, SC (864) 848-9770
- 2. TMB Associates: San Fernando, CA (818) 899-8818
- 3. Union Connector: Jacksonville, FL (631) 753-9550
- 4. BMI Supply: Queensbury, NY (518) 793-6706
- 5. Lex Products: Shelton, CT (800) 643-4460

2.2 SPECIALTY SUBCONTRACTORS

- A. The systems described herein shall be provided by a single contractor. The following subcontractors are pre-approved bidders for work contained in this specification:
 - 1. Barbizon Lighting, John Gebbie, New York, NY (212) 586-1620
 - 2. Barbizon Lighting, Scott Stipetic, Woburn, MA (781) 935-3920
 - 3. Candela Controls, Bill Ellis, Winter Garden, FL (407) 654-2420
 - 4. High Output, Mark Shore, Canton, MA (781) 364-1812
 - 5. Main Stage, Tripp Oliver, Pensacola, FL (800) 851-3618
 - 6. Vincent Lighting Systems, Bill Groener, Solon, OH (216) 475-7600
 - 7. Starlite, Moorestown, NJ Nathan Kimball (800) 738-7400
- B. Other Contractors wishing to bid must submit qualifications to the Architect, Theatre Consultant, and Client for approval prior to bid.
 - 1. Requirements:
 - a. Specialty Subcontractor and the individuals responsible for installation in the field shall have been continuously engaged in the sales and integration of theatrical lighting fixtures equipment similar to that specified herein for a minimum of ten (10) years and shall have supplied at least eight (8) installations of this type and scope.
 - Specialty Subcontractors shall have at time of bid and continuously maintain throughout the project and warranty period a Specialty Contractor's license appropriate for work in this Section.

C. Substitutions:

1. Substitutions, changes, or deletions from the plans and Specifications will not be allowed without the prior written approval of the Architect.

a. Substitution proposals from manufacturers not listed herein shall be accompanied by sufficient catalogue data, specifications, technical information, shop drawings, and samples to prove equivalence or superiority of the proposed substitution.

2.3 MANUFACTURED UNITS

A. Performance Requirements:

- 1. Provide electrical equipment listed and labeled for use as indicated by UL or other independent test agency acceptable to the Code Authority or jurisdiction.
- 2. Provide lamps and lighting instruments to operate from 115 volt 60Hz AC, unless otherwise stated.

3. Lighting Instruments:

- a. Provide each lighting instrument with a C-clamp, black safety cable, specified lamp, power cable fitted with the specified grounded connector and one frame.
- b. Provide lighting instruments with operating knobs and handles safe to touch for precise operation at all times.
- c. Provide space for two (2) filters in removable frames in each lighting instrument.
- d. Provide a slot on ellipsoidal spotlights for insertion of an iris or template holder.
- e. Provide focus adjustment of ellipsoidal spotlights from a sharp edge beam to a soft edge beam without stray light rays or extraneous internal reflections from the lens tube.

f. Connectors:

- i. Provide each permanently cabled lighting instrument with a standard length of not less than three (3) feet, three (3) conductor cable and grounded stage connector as specified.
- ii. Provide each demountable cabled lighting instrument with a 5'-0" length of cable and grounded specified connector.
- iii. Where the fixture does not come with the specified connector, an adapter shall be provided.
- g. Securely ground metalwork of lighting instruments.
- h. Ventilate lighting instruments such that no reduction in rated lamp life or deterioration of the component parts of the lighting instruments may be attributed to overheating.

B. General:

- 1. Supply all cyclorama lights and mini strips with the following components:
 - a. Floor trunions: Standard accessory product by manufacturer or approved equal.
 - b. Hanging irons: Standard accessory product by manufacturer or approved equal.

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- c. Clamp: Standard accessory product by manufacturer, Altman 510, or approved equal.
- d. Safety cable: Standard accessory product by spotlight manufacturer or approved equal black in color. Provide two (2) for striplight fixtures.

2. Supply all LED fixtures with:

- a. High resolution lens tube in specified beam degrees (when available)
- b. Incandescent emulation profile

- c. 16-bit flicker-free dimming from 100% to 0%
- d. Video mode for flicker-free operation on camera
- e. RDM for remote addressing and profile selection
- f. Clamp: Altman 510, or approved equal.
- g. Power-in, Power-thru, DMX input and output receptacles
- h. Safety Cable: Standard accessory product by spotlight manufacturer or approved equal black in color. Provide two (2) for striplight fixtures.
- i. One (1) specified connector to Edison AC input cable.
- j. Pars: Fixtures include a complete "round" lens kit including; VNSP, NSP, MFL, WFL and Extra Wide
- 3. Supply all automated lighting instruments with the following components:
 - a. Two (2) half coupler pipe clamps with black finish for 1.9 inch O.D. pipe and any additional mounting hardware required to hang each fixture, unless noted otherwise.
 - i. Acceptable Product: Mega Claw: Natural, Part #55.6841.0001
 - b. Two (2) steel channel strut mounting bolts, or other hardware required to mount fixture to steel channel strut.
 - c. Two (2) rated safety cables custom manufactured for this application. The safety cable shall be 12 inches long 1/8 inch cable with loops in either end. A rated quick link shall be provided for affixing the safety cable.
 - d. One (1) powerCON 20APowerCON specified connector to Edison AC input cable
 - e. One (1) 5 pin XLR DMX cable, male/female ends 5'-0" long
- C. LED Ellipsoidal Lighting Fixtures Multi-Color:
 - Fixed Angle 5 Degree:
 - a. Electronic Theatre Controls ColorSource Spot Deep Blue CSSPOTDB
 - i. 405LT lens tube
 - ii. Soft Focus Diffuser
 - iii. Smooth Wash Diffuser
 - 2. Fixed Angle 10 Degree:
 - a. Electronic Theatre Controls ColorSource Spot Deep Blue CSSPOTDB
 - i. 410LT lens tube
 - ii. Soft Focus Diffuser
 - iii. Smooth Wash Diffuser
 - 3. Fixed Angle 14 Degree:
 - a. Acceptable Product:
 - i. Electronic Theatre Controls ColorSource Spot Deep Blue CSSPOTDB

- a. 414LT lens tube
- b. Soft Focus Diffuser

- c. Smooth Wash Diffuser
- 4. Fixed Angle 19 Degree:
 - a. Acceptable Products:
 - i. Electronic Theatre Controls ColorSource Spot Deep Blue CSSPOTDB
 - a. 419EDLT lens tube
 - b. Soft Focus Diffuser
 - c. Smooth Wash Diffuser
- 5. Fixed Angle 26 Degree:
 - a. Acceptable Products:
 - i. Electronic Theatre Controls ColorSource Spot Deep Blue CSSPOTDB
 - a. 426EDLT lens tube
 - b. Soft Focus Diffuser
 - c. Smooth Wash Diffuser
- 6. Fixed Angle 36 Degree:
 - a. Acceptable Products:
 - i. Electronic Theatre Controls ColorSource Spot Deep Blue CSSPOTDB
 - a. 436EDLT lens tube
 - b. Soft Focus Diffuser
 - c. Smooth Wash Diffuser
- D. LED PAR/Wash Lighting Fixtures Zoom Multi-Color:
- E. LED PAR/Wash Lighting Fixtures Multi-Color:
 - 1. Acceptable Products:
 - a. ETC ColorSource PAR without lens
- F. LED Strip Light/Cyc Light Fixtures Multi-Color:
 - 1. Acceptable Product:
 - a. Electronic Theatre Controls ColorSource Linear 2 (1 meter) (Deep Blue)
- G. Followspot Lighting Fixtures:
 - 1. Medium Throw: Range of use 100 feet to 150 feet
 - a. 2000 watt Xenon lamp
 - b. Manual dimming control
 - c. Horizontal masking shutter control
 - d. Mechanical dimmer shutters
 - e. Built-in manual color changer for minimum of six different color frames

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f. Provide elapsed time meter if using xenon light source.

- g. Provide power supply for light source in self-contained, freestanding unit suitable for operation from 208 volts, 60 Hz, supply.
- h. Supply plug on cord to unit and ballast.
- i. Provide mounting yoke.
- j. Provide stable low boy floor base for units.
- k. Acceptable Products:
 - i. Strong Xenon Super Trouper III
 - ii. Canto Tango 2000, 2000FF HD
 - iii. Lycian Model #2040-25/E M2
 - iv. Or approved equal

H. Accessories:

- 1. Performance Lighting Fixture Accessories
 - a. Drop-in iris and template holders:
 - i. Standard accessory product by spotlight manufacturer
- 2. Performance Lighting Fixture Hardware:
 - Pipe Side Arms
 - i. Provide 24 inch side arms each to consist of 24 inch sections of Schedule 40 1.9 inch OD pipe with fixed cheeseborough-type clamp.
 - ii. Acceptable Product:
 - a. City Theatrical #210
 - b. 12" Side Arms
 - i. Provide each with two (2) sliding tees, set screws, and C-clamp adjustable for pipe up to 2 inch OD.
 - ii. Acceptable Products:
 - a. Altman 509-12-1
 - b. City Theatrical #220
 - c. 24" Side Arms
 - i. Provide each with two (2) sliding tees, set screws, and C-clamp adjustable for pipe up to 2 inch OD.
 - ii. Acceptable Products:
 - a. Altman 509-24-2 or approved equal
 - b. City Theatrical #204

I. Cables:

- 1. Connectors:
 - a. Provide all fixtures and single circuit jumper cables with the following connectors as the "specified connector" in male and female unless otherwise noted:

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i. PowerCON (PC)

- a. 20amp 120v powerCON 20A
 - i. Neutrik NAC3FCA
 - ii. Neutrik NAC3FCB
- b. 20amp 120v 19-Pin multi connectors
 - i. LEX Products #LSC19-LMC-29 male or equal
 - ii. LEX Products #LSC19-LFC-29 female or equal
- c. 15amp 120v NEMA L5-15
 - i. LEX Products #4720-CB male or equal
 - ii. LEX Products #4729-CB female or equal
- d. 20amp 120v NEMA L5-20
 - i. LEX Products #2311-CB male or equal
 - ii. LEX Products #2313-CB female or equal
- e. 15amp 125v NEMA 5-15
 - i. Leviton 515PR male or equal
 - ii. Leviton 515CR female or equal
- f. 20amp 208v NEMA L6-20
 - i. LEX Products #HBL-2321-BLK male or equal
 - ii. LEX Products #HBL-2323-BLK female or equal
- g. Ethernet
 - i. Neutrik #NE8 Series Black Shell
- h. DMX
 - i. Neutrik #NC5MXX-B 5-pole male or equal
 - ii. Neutrik #NC5FXX-B 5-pole female or equal
- J. Jumper cables and two-fers:
 - General:
 - a. All cables shall be labeled for length at each end and using the following color chart:
 - i. 5' red
 - ii. 10' yellow
 - iii. 25' green
 - iv. 50' blue
 - v. 75' orange
 - vi. 100' white
 - b. Provide two clear loose heat shrink sleeves on each cable, for use by the Owner.

- c. All cables and two-fers shall be made with strict observance of polarity.
- 2. Stage jumper cables shall meet the following requirements:

- a. 20A jumpers shall be made of black type "SO" (extra hard usage), three (3) conductor, #12 cable.
 - i. 20A connectors shall be as noted in the schedule.
 - ii. "Moving Light" jumper cables shall be L6-20 connectors as noted in the schedule.
- b. 60A jumpers shall be made of black type "SO", three (3) conductor, #6 cable.
 - 60A connectors shall be Union Connector 2P&G crimp type.
- 3. Two-fers shall meet the following requirements:
 - a. All two-fers shall be made of black type "SJO" (junior hard service), three (3) conductor, #12 cable.
- 4. Extension cords shall meet the following requirements:
 - a. All extension cords shall be made of black type "SJO" (junior hard service), three (3) conductor, #12 cable with specified colored tape at each end.
 - b. All connectors shall be three prong, Edison type all black connectors.
- K. Multicables, Break-outs, Fan-outs, and Break-ins:
 - Provide 6 circuit, 20A, 12/14 cable:
 - a. TMB Procable #PC12/14T or equal
 - 2. Comply with USITT recommended practice RP-1.
 - 3. Provide a Kellems grip for each connector on cable lengths 50 feel and over.
 - 4. Each multicable shall each have male and female 6 circuit, 19 pin, 25A connectors with all metal machined aluminum back shell and shall mate ground first.
 - 5. Batten lay breakouts shall have a male 6 circuit, 19 pin, 25A connectors with all metal machined aluminum back shell and shall be mate ground first with staggered, batten-lay specified connector receptacles on SJO cable.
 - a. Shortest breakout cable shall be 6'-0".
 - b. Spacing shall be 18 inches.
 - 6. Break-outs shall have a male 6 circuit, 19 pin, 25A connectors with all metal machined aluminum back shell and shall be fitted with the specified connector receptacles on SJO cable.
 - a. Length: 10 feet
 - 7. Break-ins shall have a female 6 circuit, 19 pin, 25A connectors with all metal machined aluminum back shell and shall be fitted with the specified connector receptacles on SJO cable.
 - a. Length: 10 feet

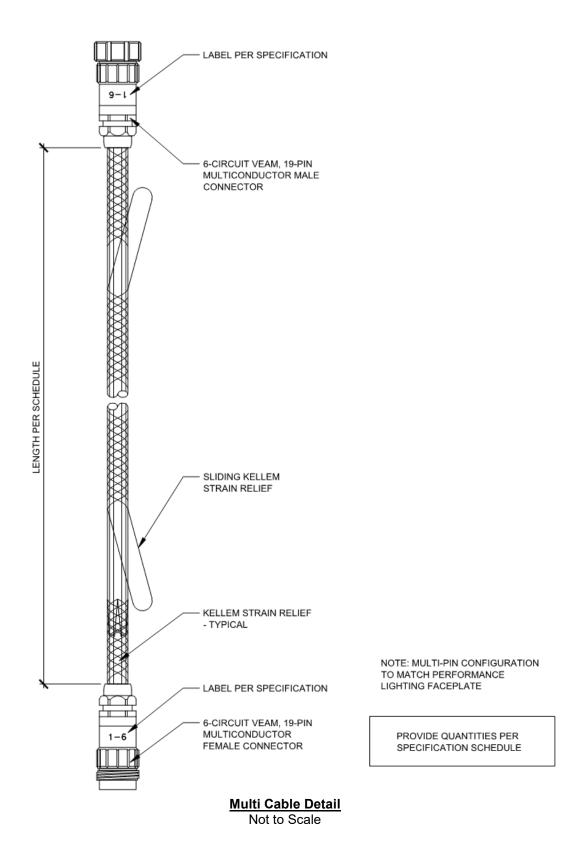
L. DMX Cables:

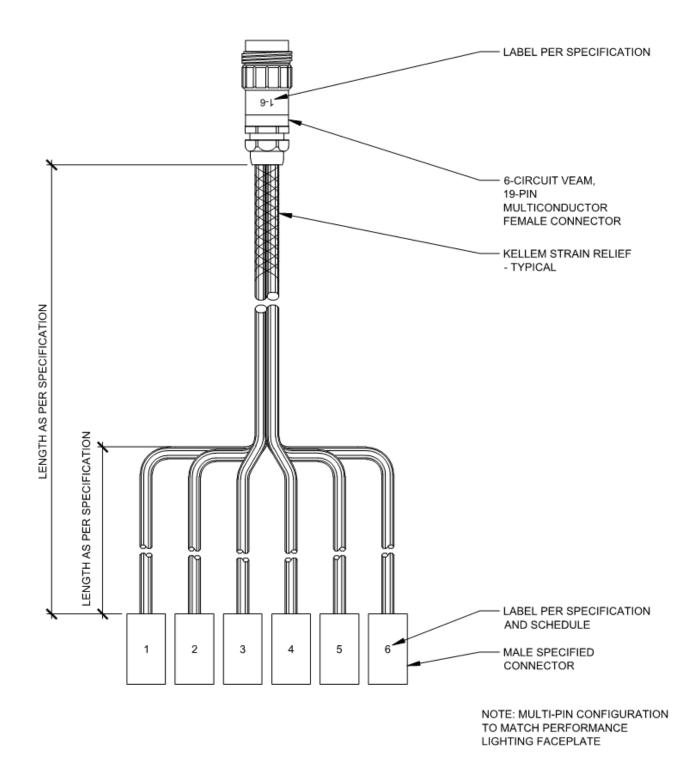
- 1. Provide TMB ProPlex PC224P with black 5-pin XLR Neutrik gold contact connectors or equal
 - a. Provide hook and loop cable tie.
- M. Ethernet Cables:
 - 1. Provide TMB ProPlex PCCAT5P with black EtherCon Neutrik connectors or equal.

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a. Provide hook and loop cable tie.

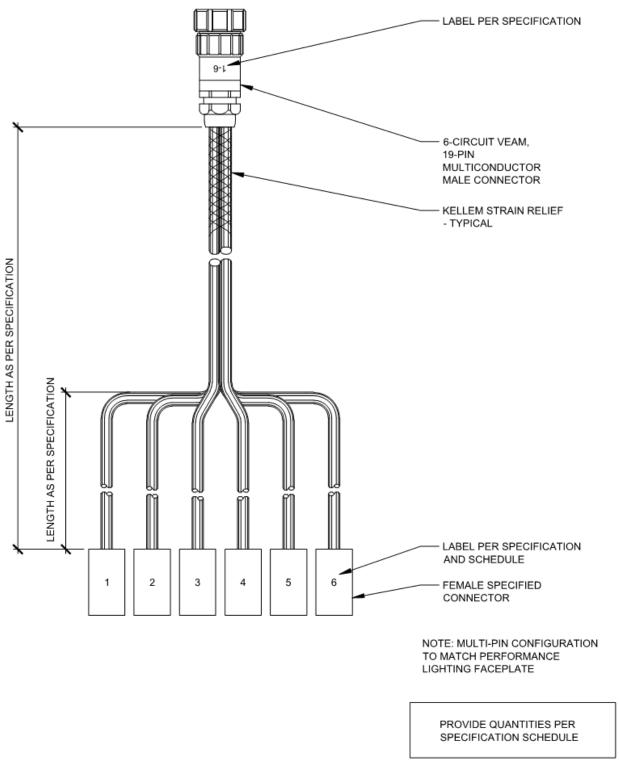
- N. Signal Distribution: (REMOVE IF NOT NEEDED OR SHOWN ON SCHEDULE)
 - 1. Portable DMX Opto-Splitter:
 - a. Acceptable products
 - i. Pathway Connectivity #9114 (8)
 - ii. Doug Fleenor Design #-123 (3) -125 (5) -1211 (11)
 - 2. Portable 12 Port Gigabit Ethernet Switch:
 - a. Acceptable Product:
 - i. Pathway Connectivity Pathport VIA12
 - a. External power supply for POE
 - b. Wireless DMX transceiver
 - i. Acceptable Product:
 - a. City Theatrical Multiverse System



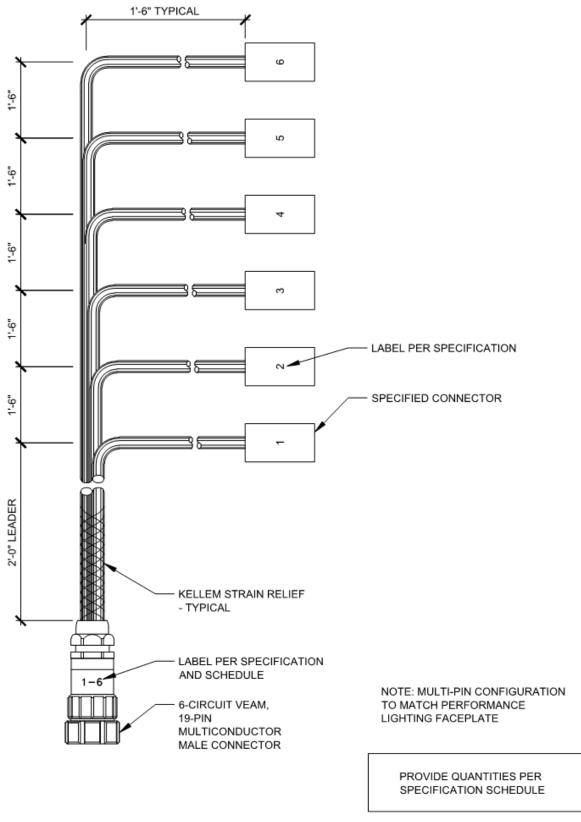


PROVIDE QUANTITIES PER SPECIFICATION SCHEDULE

Multi Cable Fan in Detail Not to Scale

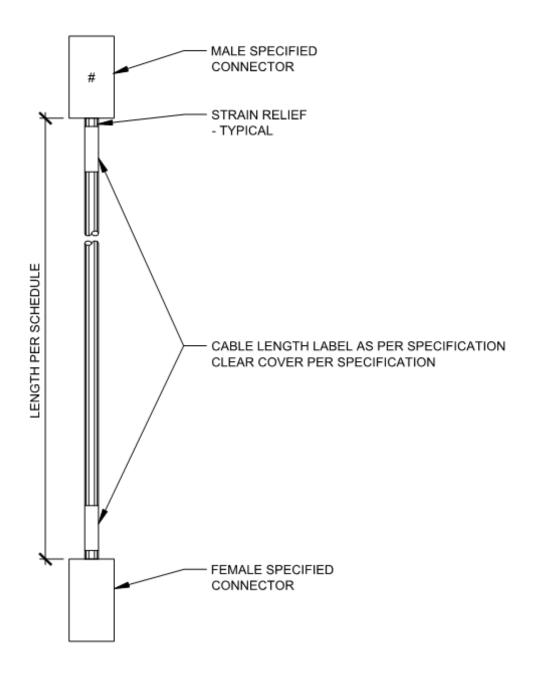


Multi Cable Fan Out Detail Not to Scale



Multi Cable Break Out Detail Not to Scale

Dobbs Ferry UFSD Middle School / High School



Pin Cable Detail
Not to Scale

- 2.4 EQUIPMENT NOT USED
- 2.5 COMPONENTS NOT USED
- 2.6 ACCESSORIES NOT USED
- 2.7 MIXES NOT USED
- 2.8 FABRICATION NOT USED
 - A. Shop Assembly Not used
 - B. Fabrication Tolerances Not used
- 2.9 FINISHES NOT USED
 - A. Shop Priming Not used
 - B. Shop Finishing Not used
- 2.10 SOURCE QUALITY CONTROL NOT USED
 - A. Tests, Inspection Not used
 - B. Verification of Performance Not used

PART 3 - EXECUTION

- 3.1 INSTALLERS -NOT USED
- 3.2 EXAMINATION
 - A. Site Verification of Conditions:
 - Examine areas where performance lighting instruments are to be mounted or otherwise installed and verify that conditions are satisfactory for installation and comply with manufacturer's requirements and those specified in this section.
 - 2. Do not proceed with installation until unsatisfactory conditions have been corrected.
- 3.3 PREPARATION NOT USED
 - A. Protection Not used
 - B. Surface Preparation Not used
- 3.4 ERECTION, INSTALLATION, APPLICATION, CONSTRUCTION
 - A. Delivery, Inventory and Testing:
 - 1. Coordinate an area and time for delivery and testing with the contractor and the Owner.

- a. Area must be clean and free of construction debris.
- b. Area for this work must be no less than 6 square feet per fixture. Often the best space for this work is the stage floor.
- Area must be available for a minimum of two contiguous days without interruption by other trades and deliveries.
- 2. Deliver, unpack, and organize all equipment for inspection.
 - a. Equipment will not be inventoried in its packaging material.
- 3. Fixtures, accessories, and equipment shall be prepared for handover to the Owner.
- 4. Install accessories where applicable, in accordance with manufacturer's written instructions and with recognized industry practice to ensure that performance lighting equipment complies with applicable requirements of NEC and UL standards.
- 5. Organize the fixtures and equipment based on type and designated performance space.
- 6. Organize the inventory process. Provide three (3) copies of the current Bill of Materials.
- 7. Provide power and control devices for random testing of the fixtures and accessories.
- 8. Followspots:
 - Unpack and assemble the followspots.
 - b. Move the followspots to the followspot booth or areas as directed by the Owner.
 - c. Connect the followspots to building power.
 - d. Align the lamps and verify operation of the controls.
 - e. Level and balance the followspots.
 - f. Install the Telrad followspot sight, if specified.

9. Storage:

- a. Store the fixtures and accessories as directed by the Owner.
- b. Provide personnel to hang the fixtures on stage battens and to load weights as needed to fly the storage battens.
- Assemble the storage carts, if specified, and hang fixtures, cables and accessories on the carts. Move the carts to storage locations as directed by the Owner.
- d. Move the fixtures and accessories to storage rooms or catwalks as directed by the Owner.
- 10. Dispose of all packing material.
- B. Interface with Other Work Not used
- C. Sequences of Operation:
 - 1. Room painting and finishes shall be complete prior to installation.
 - Install stage lighting and accessories based on the light plot provided
 - Stage lighting fixtures listed herein shall be installed using industry standard practices.

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b. Stage lighting fixtures shall be plugged to power and control circuits as shown on the light plot.

- Cables shall be dressed with tie line with sufficient slack to allow repositioning of the fixtures.
- d. Fixtures shall be addressed and patched according to the Owner's direction.
- e. Test the theatrical lighting installation to verify circuit and control assignments and correct found problems.
- f. Notify the Architect when the items above are complete.
- 3. Theatrical Fixture Supplier shall provide a board operator and three (3) theatrical electricians for a period not to exceed forty (40) hours to execute the focus.
 - a. Theatrical Lighting Fixture Supplier shall designate one of the theatre electricians as the head electrician for the job. That person shall attend each focus session.
 - b. Theatrical Lighting Fixture Supplier shall identify the board operator for the job. That person shall attend each focus session and each cueing session.
 - c. Board operator shall attend each focus session.
 - d. Board operator and theatrical electricians shall work with the lighting designer and owner's representative to focus fixed luminaires and to prepare moving light fixtures for cueing.
 - e. Forty (40) hour period shall be split into five (5) sessions not exceeding eight (8) hours.
 - i. Sessions may not occur on contiguous days.
 - ii. Sessions may not fall within standard business hours.
 - f. Board operator shall be well-experienced with the specified console specifically with the ability to address, patch and program moving lights and LEDs.
 - g. Theatrical electricians shall be experienced with trouble-shooting the control system and focusing theatrical fixtures.
 - h. Theatrical Fixture Supplier shall provide access equipment and tools to complete the cue session and trouble shoot problems which may arise during the cueing sessions.
 - i. Hours used to correct problems with the control system or luminaires shall not be deducted from the forty (40) hour total.
 - Eight (8) hour sessions will be the maximum hours worked in one (1) session regardless of progress or time devoted to troubleshooting repairs in the control system.
- D. Site Tolerances Not used
- 3.5 REPAIR/RESTORATION NOT USED
- 3.6 FIELD QUALITY CONTROL
 - A. Site Tests, Inspection:
 - 1. Visual and Mechanical Inspections: Include the following:
 - a. Inspect each spotlight and other loose items of equipment for defects, failure, corrosion, physical damage, and labeling as required.
 - b. Exercise and perform operational tests on mechanical parts and operable devices according to manufacturer's instructions or routine functional operation.

2. Acceptance Testing:

- a. Comply with the following conditions required for commissioning:
 - i. All handover and loose equipment provided under this section to be on site and available for testing.
 - ii. Provide full and uninterrupted access to stage, auditorium, and technical areas required for commissioning tests. Blackouts of lighting will be required.
 - iii. Contractor's project representative to be present during tests as required.
 - iv. Provide personnel to operate equipment and perform adjustments as necessary.
 - v. Provide access equipment as required.
 - vi. Provide walkie-talkie or other communication devices as required.
 - vii. Provide a male Edison adaptor so fixtures can be hot tested from convenience outlets in the theatre.
 - viii. Review manuals, warranties, and turn over documents.
- B. Manufacturers' Field Services Not used
- 3.7 ADJUSTING NOT USED

3.8 CLEANING

A. Clean performance lighting equipment of dirt and debris using methods and materials as recommended by manufacturers upon completion of installation.

3.9 DEMONSTRATION

A. Provide the services of a qualified manufacturer's representative to provide a minimum of two (2) hours of training in the operation and maintenance of the equipment specified herein. Training sessions shall consist of one (1), six (6) hour session at times separate from the checkout of the system. Arrange training time for the convenience of Owner to take place during the first six (6) months after building acceptance.

3.10 PROTECTION

A. Protect installed performance lighting equipment and lamps during remainder of construction period.

3.11 SCHEDULE

	Description	Theatre 1	Add/Alternate
LED Ellipsoidal Fixtures Multi-color Light			
1	5 Degree Ellipsoidal	4	
2	14 Degree Ellipsoidal	10	
3	19 Degree Ellipsoidal	21	
4	26 Degree Ellipsoidal	15	
5	36 Degree Ellipsoidal	10	
Ellipsoidal Accessories			
6	Half hat for 19 thru 90 degree ellipsoidal	4	
7	Drop in Iris	2	
8	Pattern holder (A size)	8	
9	Pattern holder (B size)	2	
10	C-clamp (black only)	2	
11	Safety cable (32 inch)	2	
LED PAR/Wash Fixtures Multi Color			
12	PAR/Wash multi-color	18	
LED Cyclorama/Strip Lights			
13	Cyc Light	6	
Followspots			
14	Followspot - Medium throw		2
Followspot Spare Lamps			
15	Followspot lamp medium throw		2
Accessories			
16	Side arms 24"	6	

		1	1
	Description	Theatre 1	Add/Alternate
Power Cable			
17	Jumper cable – 20A – 5 '- specified connectors	40	
18	Jumper cable – 20A - 10' - specified connectors	40	
19	Jumper cable – 20A - 25' - specified connectors	10	
20	Jumper cable – 20A- 50' - specified connectors	2	
21	Jumper cable - 20A - 10'- (M Edison to specified connector)	20	
22	Jumper cable - 20A - 25'- (M Edison to specified connector)	6	
23	Jumper cable - 20A - 50'- (M Edison to specified connector)	2	
24	Jumper cable - 20A 12/3- 10'- (L5-20 to L5-20)	4	
25	Jumper cable - 20A - 25'- (L5-20 to L5-20)	4	
26	Jumper cable - 20A - 50'- (L5-20 to L5-20)	2	
27	Extension cord - 20A - 50'-Black - (Edison to Edison)	4	
Signal Cable			
28	5' DMX extension (5-Pin) XLR	30	
29	10' DMX extension (5-Pin) XLR	30	
30	15' DMX extension (5-Pin) XLR	40	
31	25' DMX extension (5-Pin) XLR	10	
32	50' DMX extension (5-Pin) XLR	4	
33	DMX termination connector	2	
34	DMX 5-pin female-to-female	4	
35	DMX 5-pin Male-to-Male	4	
Network			
36	25' Ethernet cable-RJ 45	6	
37	75' Ethernet cable-RJ 45	1	

Note: Schedule is not all inclusive. Refer to specification for additional equipment and accessories.

END OF SECTION 11 61 91

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SECTION 11 68 33.33 – BAEBALL / SOFTBALL ATHLETIC FIELD EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Softball equipment.
- 2. Foul Pole Equipment.
- 3. Dugout System.
- 4. Team benches.

B. Related Sections:

- 1. Section 03 30 00 "Cast-in-Place Concrete"
- 2. Section 31 20 00 "Earth Moving"
- 3. Section 32 18 23.13 "Baseball Softball Field Surfacing"
- 4. Section 32 92 00 "Turfs and Grasses"
- 5. Section 32 31 13 "Chain Link Fences and Gates"

1.3 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with the other specified requirements, the most restrictive requirements shall govern.
 - 1. National Federation of State High School Associations (NFSHSA).
 - 2. American Sports Builders Association (ASBA)
 - 3. Manufacture's Data and Recommended Installation Requirements.
 - 4. New York State Public High School Athletic Association Inc. (NYSPHSAA)

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Baseball / Softball foul pole footing designed based on local soil conditions and building code. Include factors affecting the baseball / softball foul pole footing design.

1.5 SUBMITTALS

A. General: Submit all action submittals and informational submittals required by this Section concurrently.

- B. Action Submittals: Product Data for equipment, accessories and hardware:
 - 1. Softball equipment.
 - 2. Foul Pole Equipment.
 - 3. Dugout System.
 - 4. Team benches.
 - 5. Shop Drawings: For athletic field equipment. Include plans, elevations, sections, details, and attachments to other work.
 - 6. Samples for Initial Selection: For each type of athletic equipment indicated.
 - a. Manufacturer's color charts.
- C. Informational Submittals:
 - 1. Qualification Data: For qualified Installer.
- D. Closeout Submittals:
 - 1. Maintenance Data: For athletic field equipment and finishes to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers approved by manufacturer.
 - 1. Modular Softball Dugout: Installer should have a minimum of five (5) softball equipment installations or similar experience in the previous three (3) years.
 - 2. Modular Softball Foul Poles: Installer should have a minimum of five (5) softball equipment installations or similar experience in the previous three (3) years.
- B. All site amenities shall be produced in a plant of recognized reputation that is regularly engaged in the production of the type of site amenity conforming to the specified standards. Site amenities of the same type shall be the product of a single manufacture.
- C. Only products proven non-toxic are acceptable. Products used may not contain any recycled wood products or any wood containing paint, chemicals (including but not limited to Chromated copper arsenate (CCA)) or additives.
- D. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to the industry standards and inspection requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Owner's representative.
- B. Sound materials shall be stored off the ground and under protective cover or indoors in a manner that will not allow distortion or other damage to occur.
- C. Handle materials according to manufacturer's written instructions.
 - 1. Materials shall be moved, loaded, and unloaded such that they will not be subject to excess stress. Permanent distortion or other damage attributable to Contractor's operation shall be cause for rejection.

PART 2 - PRODUCTS

2.1 SOFTBALL EQUIPMENT

- A. Breakaway Bases: Complete set of three 15 x 15 inch breakaway bases with base tops, buried base plates, and anchor housings and hardware, including dugout tool, at each field.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Rogers USA Inc., Break Away Base System Teen Mode RBBS-T including double first base orange and white; or comparable product as follows.
 - a. Schutt Hollywood Kwik-Release Base Set without anchors Varsity set including Double First Base orange and white.
- B. Low-Impact Bases with Anchors: Complete set of three compressible rubber low impact bases with stanchion, anchor, and hardware.
 - 1. Basis-of Design Product: Subject to compliance with requirements, provide Hollywood Impact Base Set with Anchors or comparable product.
- C. Home Plate: One-piece rubber construction modular component home plate system with black beveled collar and non-skid surface; 5/16" thick and 3" high.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Hollywood Bury-All Home Plate or comparable product.
- D. Pitcher's Rubbers: Four-sided rubber, 6 x 6 x 24 inches in size.
- E. Basis-of-Design Product: Subject to compliance with requirements, provide Rogers USA Inc., Pro Style 4-Sided Pitcher's Rubber Model RPP-PS; or comparable product.

2.2 ALUMINUM FOUL POLE WITH MESH WING

- A. Softball 20' Aluminum Foul Pole with Mesh Wing:
 - 1. Basis-of Design-Product: Subject to compliance with requirements, provide "20' Softball Foul Pole with Wing" Model FPW420 (LGFPW420); or equivalent product manufactured by: Sportsfield Specialties Inc., P.O. Box 231, 41155 State Highway 10, Delhi, NY 13753. Telephone: 888-975-3343, Fax: 607-746-8481, Web: www.sportsfieldspecialties.com
 - 2. 24' overall length, with 20' length above finish grade.
 - 3. Components to meet the following:
 - a. Foul Pole Fabricated with 4.0in OD x .125in Wall 6061-T6 Aluminum Tube:
 - 1) 20.0ft Above Ground Height
 - 2) Powder Coated Finish: White
 - b. Foul Pole Ground Sleeve GS448 (GS-04-48) Fabricated with 4.30in OD (4.10in ID) Aluminum Tube:
 - 1) 4.0ft Length
 - 2) Aluminum Mill Finish
 - 3) Ground Sleeve Caps
 - c. Angled Wing Fabricated of .125in Aluminum:
 - 1) Stamped Mesh, 1.50in x 1.50in Punchouts
 - 2) 18.0in Wide x 12.0ft Long
 - 3) Double Reinforced Bends, Welded at Corners
 - 4) Powder Coated Finish: White
 - d. Accessories:
 - 1) Stainless Steel Assembly Bolts and Nuts
 - 4. Product to meet the following load conditions: (Per ASCE 7-10)
 - a. Wind: 105 mph, Exp. "C", I = 0.77
 - b. Seismic: N/A

2.3 MODULAR SOFTBALL DUGOUT

- A. Components
 - 1. Overall Dimensions: Standard 8'-6" Wide x 16' Long,
 - 2. Structural Columns Fabricated of 3.5" x 3.5" x 3/16" (0.1875")

- 3. Thick Steel Tube with Factory Pre-Drilled 9" x 9" x 1/2" (0.5")
- 4. Thick Steel Base Mounting Plates and 9" x 9" x 3/8" (0.375")
- 5. Thick Steel Roof and Column Cap Plates, Welded Construction Maximum Allowable Spacing Between Structural Steel Columns is Fifteen Feet (15') on Center.
- 6. Roof Frame Fabricated of 5" x 2" x 3/16" (0.1875") Thick Steel Rectangular Perimeter and Transverse Tubes and 3" x 2" x 1/8" (0.125") Thick Steel Rectangular Longitudinal Tubes, Welded Construction.
- 7. Maximum Allowable Roof Frame Width is 10'-6".
- 8. Structural Steel Columns and Roof Frame Receive a Powder Coated Primer and Finish, Various Standard and Custom Colors Available.
 - a. Color to be selected by Architect from manufacturer's full range.
- 9. Roofing Material is 29 Gauge, Classic Rib® Style Corrugated Metal with J-Channel Drip Cap Installed on Front and Sides, Various Standard Paint Finish Colors Available
 - a. Color to be selected by Architect from manufacturer's full range.
- 10. Structural Columns Attached to Roof Structure with Galvanized Hardware.
- 11. Includes Carbon Steel Anchoring Hardware, Epoxy and Lifting Eye Bolts.
- 12. Model Specific Hardware Kit and Installation Instructions.
- 13. Maximum Wind Speed Load: 130 mph.
- 14. Maximum Ground Snow Load: 50 psf.
- 15. Seismic = Ss=150%, S1=75%.
- 16. Basis-of-Design Product: Subject to compliance with requirements, provide Sportsfield Specialties, LG-GS-08X16-130 GameShade® Lone Gone Baseball/Softball Dugout Equipment.
- B. Dugout Design Criteria:
 - 1. Maximum Wind Speed Load: 130 mph
 - 2. Maximum Ground Snow Load: 50 psf
 - 3. Seismic = Ss=150%, S1=75%

2.4 TEAM BENCHES

A. Two-Tier Polyboard Team Bench:

1. Basis of Design Product: PTBTT 15' (LG-TTPY) Two-Tier Polyboard Team Bench, as manufactured and/or supplied by: Sportsfield Specialties, Inc., P.O. Box 231, 41155 State Highway 10, Delhi, NY 13753, Telephone: 888-975-3343, Website: www.sportsfieldspecialties.com

2. Components:

- a. Welded frame fabricated with 1/8" (0.125") formed aluminum and 2" x 2" x 1/8" (0.125") square aluminum tubing.
- b. Powder-coated finish on frame, with Royal Blue.
- c. 15' or as indicated otherwise.
- d. 2" x 4" and/or 2" x 6" Polyboard seat and backrest planking material, with Gray polyboard
- e. Polyboard planking material manufactured from 90% recycled post-consumer plastic
- f. Stainless steel assembly hardware
- g. Galvanized steel anchoring hardware
- h. Semi-permanent mount required
- i. Two-Tier seating capability
- j. No on-site assembly required
- k. Model specific hardware kit and installation instructions

B. Cast-In-Place Concrete:

1. Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" to produce normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3,000 psi, 3-inch slump, and 1-inch-maximum-size aggregate.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, site surface and subgrade drainage, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Verify that athletic field layout and equipment locations comply with requirements for each type and component of equipment.

3.3 MODULAR SOFTBALL DUGOUT INSTALLATION

A. Anchoring Requirements:

- 1. Carbon Anchors and Epoxy Supplied by Manufacturer to be Used in Conjunction with Factory Pre-Drilled Base Plates Mounted on Concrete Slab or Concrete Footings Determined by Others Based on Local Soil Conditions and Building Codes.
- 2. Minimum Requirements for Anchoring Modular Dugouts: 5/8" Diameter Hilti HAS Rods Secured with Hilti HIT-HY 150 MAX Adhesive, Maintain 5" Embedment into 3,000 psi Normal Weight Concrete with at Least 5" (GameShade®) or 7" (Enclosed and Cantilever) of Edge Distance to Anchor Each Base Plate.

3.4 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Anchor equipment securely, positioned at locations and elevations indicated.
- B. Unit Set on Grade: Level bearing surfaces to required elevation.
- C. Set with Concrete Footing: Comply with ACI 301 for measuring, batching, mixing, transporting, forming, and placing concrete.
 - 1. Embedded Items: Use setting drawings and manufacturer's written instructions to ensure correct installation of anchorages for equipment.
- D. Permanently Placed Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with field layout.
- E. Semi-Permanently Placed Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure, with appropriate removable components; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with field layout.
 - 1. Bases: Install concrete filled housings on properly leveled subgrade. Install base components in compliance with manufacturer's instructions.
 - 2. Home Plate: Install home plate components in compliance with manufacturer's instructions.
 - 3. Pitcher's Rubbers: Install in compliance with manufacturer's instructions.
 - 4. Two-Tier Polyboard Team Bench: Install as recommended per manufacturer's written instructions and as indicated on the drawings.

F. Removable Equipment and Components: Set in place to verify that equipment and components are complete and in proper working order. Instruct Owner's designated personnel in properly handling, assembling, adjusting, disassembling, transporting, storing, and maintaining units. Remove athletic equipment after assembled configuration has been approved by Architect, and store units in location indicated by Owner.

3.5 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. Inform Architect 48 hours in advance when inspections are to take place.

3.6 ADJUSTING AND CLEANING

A. areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with the requirements for touching up shop-painted surfaces.

3.7 PROTECTION

A. Protect finishes of athletic field equipment from damage during construction period with temporary protective coverings approved by manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 11 68 33.33

SECTION 12 24 13 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Manually operated roller shades with single rollers.
 - 2. Roller shade fabrics.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.
- B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations, all dimensions and clearances for each shade installation.
 - 1. Include typical elevation layout showing separation between shade units and meeting edges at corners with sections and details at head and sill between blind units and corners.
 - 2. Provide verified in field details showing all types of shade installation conditions.
 - 3. Components and conditions not fully dimensioned or detailed in manufacturers product data indicating relationship to adjoining construction.
 - 4. Manufactures specification instructions and details specific to components and conditions not fully dimensioned or detailed in manufactures product data.
 - 5. Provide data for all components required for installation.
- C. Samples for Verification and Initial Color Selection: For each type and color of shadeband material.
 - 1. Include Samples of accessories involving color selection.
 - 2. Actual color samples of manufactures full range no color copies will be accepted.

- 3. Shadeband Material: Not less than 10 inches square. Mark inside face of material if applicable.
- 4. Roller Shade: Full-size operating unit, not less than 16 inches wide by 36 inches long for each type of roller shade indicated.
- 5. Installation Accessories: Full-size unit, not less than 10 inches long.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of shadeband material, signed by product manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roller shades to include in maintenance manuals.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.8 WARRANTY

- A. Manufacturer's Warranty Provide manufacturer's warranty including coverage of at least following components:
 - 1. Corrosion of all metal parts.
 - 2. Sagging, creasing, or breaking of slats.
 - 3. Sagging, creasing or ripping of shadeband material.
 - 4. Smoothly performing mechanism without slippage or jams.
 - 5. Finish of all components matching in color, uniform, and against fading or discoloration.
 - 6. Defects in materials and installation workmanship.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry 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 operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Draper Inc.; Manual FlexShade Systems or comparable product by one of the following:
 - 1. Hunter Douglas Contract.
- B. 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; with chain retainer.
 - 1. Bead Chains: Manufacturer's standard.
 - a. Limit Stops: Provide upper and lower ball stops.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 - 1. Direction of Shadeband Roll: Regular, from back of roller and or back to front to clear window handles, extrusions etc.
 - 2. Shadeband-to-Roller Attachment: Manufacturer's standard method- no double-side tape will be accepted. Provide adequate brackets on multiple sash windows to hold roller pin ends no more than 1/8 inch apart over centerline of mullion.

D. Shadebands:

- 1. Shadeband Material: Light-filtering fabric similar to "Sheer-weave Series" fabric by Draper Inc.
- E. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - 1. Type: Enclosed in sealed pocket of shadeband material.

F. Fabrication:

1. Cut shades perfectly square and true and mount on rollers using suitable fasteners. Provide all material used in shade manufacture new, commercially perfect and of first quality. Provide material in one piece.

- 2. Provide one finished length of each single hung shade after hemming 14 inches longer than portion of sash covered by shade. Provide finished shade width to cover adequately, but not more than 1/4 inch of barrel exposed at each end of roller.
 - a. Where necessary, increase diameter of roller from 1-1/4 inches to correspond with size of shade.
 - b. Provide hems of proper width for slat, double turn hems, and sew with straight stitch. Neatly backstitch all hems at the ends.
 - c. Hem at top and bottom of shade.

3. Fabrication Tolerances:

- a. Size shades to fit openings head including but not limited to wall, door, window head etc., to sill including but not limited to window sill, floor sill etc. (allowing for 6 to 10 inches in additional length) and between mullions, unless otherwise indicated on Drawings.
- b. Provide single sets of shades no greater in width than distance between 2 mullions at openings up to 15 ft. wide.
- c. Provide minimum clearances for appropriate operation of shades.

G. Installation Accessories:

- 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped.
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband when shade is fully open.
 - c. Provide full range of manufactures colors.
- 2. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband when shade is fully open.
 - b. Provide full range of manufactures colors.
- 3. Endcap Covers: To cover exposed endcaps.
- 4. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.3 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Light-Filtering Fabric (Same Color Both Sides): Woven fabric, stain and fade resistant.
 - 1. Source: Roller-shade manufacturer.

- 2. Type: Woven polyester and PVC-coated polyester.
- 3. Weave: Basketweave.
- 4. Color: As selected by Architect from manufacturer's full range.
- 5. Basis-of-Design Product: Subject to compliance with requirements, provide the following Draper Inc. product or comparable product:
 - a. Light-Filtering Fabric (Same Color Both Sides) Openness Factor 3 percent: SheerWeave Series PW4400.
 - 1) Thickness: 0.037 inches.
 - 2) Weight: 20.7 oz./sq. yd.
 - 3) Locations: East-, west- and south-facing windows with clear view.
- C. Rescue Window Labels: Provide and install on window shade in every space of pupil occupancy opaque labels with words "RESCUE WINDOW" Install labels on shades associated with rescue window coordinate with Architect for location.
 - 1. Color: Opaque, bright yellow background with black letters.
 - 2. Size: 2 inches by 1 inches, 3/8" wide lines to form letters.
 - 3. Text: "RESCUE WINDOW", readable from room side of window.

2.4 ROLLER-SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
 - 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
 - 2. Outside of Jamb Installation: 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.
- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible.
- D. Rescue Window Labels: Provide and install on window shade in every space of pupil occupancy opaque labels with words "RESCUE WINDOW" Install labels on shades associated with rescue window coordinate with Architect for location.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 ROLLER-SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
 - 2. Hang shades at window to fit opening properly and operate smoothly and efficiently. Hang each shade perfectly level and with spring tension of roller properly adjusted. Locate tips of adjoining shades no further than 3/8 inch apart when two or more are mounted back to back.
 - 3. Install each shade on brackets securely fastened to ceiling or wall as shown on Drawings. Furnish and install new brackets and other hardware required for proper installation of shades.
- B. Prior to installation of roller-shade units, coordinate installation locations and method of installation with window manufacturer, do not secure roller-shade units to window frame.

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.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 12 24 13

SECTION 12 32 13 - MANUFACTURED WOOD-VENEER-FACED CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes manufactured wood-veneer-faced cabinets of stock design.
- B. Section Includes
 - 1. Wood-veneer faced casework overlay door design, including (but not limited to):
 - a. Wall, base and tall cabinets
 - b. Tops for all base units
 - c. Countertop assemblies
 - d. Solid Surface windowsills
 - 2. Accessory items, including:
 - a. All filler panels, frame units, scribe strips, strips at walls, and similar items.
 - b. Cutouts for sinks, faucets, fittings, and other plumbing and electrical fixtures, electrical and mechanical runs and connections and similar items.
 - c. Epoxy resin countertops and sinks, drains and tail pieces
 - d. Materials and devices necessary to make solid connections to existing structure
- C. Products Furnished but not Installed Under this Section
 - 1. Mechanical components, electrical components, plumbing components and similar items included with specified casework items; refer to "Sequencing and Scheduling".

1.3 DEFINITIONS

- A. Definitions in the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" apply to the work of this Section.
- B. MDF: Medium-density fiberboard.
- C. Hardwood Plywood: A panel product composed of layers or plies of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive and faced both front and back with hardwood veneers.

1.4 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that casework can be supported and installed as indicated.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Casework.
 - 2. Hinges.
 - 3. Pulls.
 - 4. Door catches.
 - 5. Drawer slides.
 - 6. Drawer and hinged door locks.
 - 7. Adjustable shelf supports.
 - 8. Grilles.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show fabrication details, including types and locations of hardware. Show installation details, including field joints and filler panels. Indicate manufacturer's catalog numbers for casework.
 - 1. Roughing Drawings: Submit roughing drawings, showing complete roughing dimensions for plumbing, ventilating and electric services and components to be installed in casework, including location of existing roughing and dimensions, where applicable.
 - 2. Groups/Assemblies: Submit shop drawings of groups or assemblies, including descriptions identifying units, parts, and accessories of each item and showing materials, dimensions, cabinet-cut details, and sink locations (where applicable).
 - 3. Field Measurements: Prior to fabrication or ordering of any specified casework items, verify measurement at Site of actual space reserved for casework items; DO NOT take measurements from Contract Drawings. Give due consideration to architectural, structural, or mechanical discrepancies occurring during building construction. Make such discrepancies immediately known to Architect and obtain clarification of discrepancy in writing before proceeding with installation of affected casework items.
 - 4. Color/Finishes: Shop drawings are not to include colors, wood finishes, stains, etc. All colors are to be selected by the Architect and issued to the contractor by an ASI during the construction phase.

C. Samples:

- 1. Casework Units: Without cost to Owner, submit samples, as requested, to demonstrate Contractor's ability to furnish required casework.
- 2. Color Selection: Submit actual samples of finishes, colors, and materials as required for color selection. Submit full range of manufacture colors, texture and wood tones.

- D. Mock-Ups: Submit following units for comparison with items installed as part of casework installation. Mock-up units must be submitted prior to or with casework submittal. Casework submittals and shop drawings will not be approved without mock-up units.
 - 1. One full-size base cabinet unit complete with hardware, doors, and drawers; without finish top.
 - 2. hinged door samples.
 - 3. One grille/louver sample.
 - 4. Wire management sample.
 - 5. Tackable door sample.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
 - 1. Joint Tolerances 400C-T-1.
 - 2. Finishness Test 400C-T-2.
- C. Sample Warranty: For special warranty.
- D. Installer Experience Listing: Submit list of completed projects using products proposed for this Project, including owner's contact and telephone number for each project, demonstrating compliance with applicable "Qualifications" requirements specified below in "Quality Assurance" article.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish complete touchup kit for each type and finish of casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged casework finish.

1.8 QUALITY ASSURANCE

- A. Manufacturer: Minimum 5-years' experience in manufacture of casework and other items similar to those specified and minimum 5 completed casework installations of similar size and requirements to that specified.
- B. Installer: Minimum 5 completed casework installations of similar size and requirements to that specified.
- C. Installer Qualifications: An authorized representative who is trained and approved by manufacturer for installation of units required for this Project and a certified participant in AWI's Quality Certification Program

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver casework only after painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified in "Project Conditions" Article.
- B. Keep finished surfaces covered with polyethylene film or other protective covering during handling and installation.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework 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. Maintain temperature and relative humidity during the remainder of the construction period in range recommended for Project location by the AWI's, "Architectural Woodwork Standards."
- B. Field Measurements: Prior to fabrication or ordering of any specified casework items, verify measurement at Site of actual space reserved for casework items; DO NOT take measurements from Contract Drawings. Give due consideration to architectural, structural, or mechanical discrepancies occurring during building construction. Make such discrepancies immediately known to Architect and obtain clarification of discrepancy in writing before proceeding with installation of affected casework items.
- C. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.

1.11 SEQUENCING AND SCHEDULING

- A. Coordinate the layout and installation of casework with all Prime Contractors. See Section 01 12 00 for each Contractor's coordination responsibilities.
- B. Refer to the casework model numbers for the plumbing and electrical fittings and fixtures that are shown to be part of the casework. Deliver these fittings and fixtures to the contractor assigned to their installation in Section 01 12 00. Obtain a signed receipt for their delivery.
- C. Provide all holes / cut outs in the casework for all Prime Contractors on the Project. Coordinate with the work on the E, P, & HVAC drawings and division 22, 23, 26, 27, and 28.

1.12 MAINTENANCE

A. Extra Materials: Furnish complete touchup kit for each type and color of wood laboratory casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.

1.13 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of casework that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of components or other failures of glue bond.
 - b. Warping of components.
 - c. Failure of operating hardware.
 - d. Deterioration of finishes.
 - 2. Contractor's Guarantee: Upon completion of installation of casework and after acceptance by Owner, furnish to Owner written statement accepting full responsibility for installation and guaranteeing adequacy and safety of attachment of all casework.
 - 3. Warranty Period: Five 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:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide "Wood Laboratory Casework Contemporary Style" by Wood-Metal Industries (Division of Wood-Mode, Inc.) Selinsgrove, PA or comparable product by one of the following:
 - 1. Kewaunee Scientific Corporation.
 - 2. Sheldon Laboratory Systems.
- C. Source Limitations: Obtain wood-veneer-faced casework with tops, sinks, special equipment, and service fixtures from same casework supplier to establish single responsibility for all casework components.

2.2 CASEWORK, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" for grades of casework indicated for construction, finishes, installation, and other requirements.
 - 1. Grade: Premium
 - 2. Provide labels and certificates from AWI certification program indicating that casework, including installation, complies with requirements of grades specified.

- B. Product Designations: Drawings indicate sizes, configurations, and finish materials of manufactured wood-veneer-faced casework by referencing designated manufacturer's catalog numbers. Other manufacturers' casework of similar sizes and door and drawer configurations, of same finish materials, and complying with the Specifications may be considered. See Section 01 60 00 "Product Requirements."
- C. Product Designations: Drawings indicate configurations of manufactured wood-veneer-faced casework by referencing designations of Casework Design Series numbering system in Appendix A of the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

2.3 WOOD-VENEER-FACED CABINETS

- A. Design:
 - 1. Lipped overlay with radiused wood edges.
- B. Wood Species: White Maple.
- C. Face Veneer Cut: Grade AA Quarter sliced.
- D. Veneer Matching:
 - 1. Provide veneers for each cabinet from a single flitch, book and running matched.
 - a. Provide continuous matching of adjacent drawer fronts within each cabinet.
- E. Grain Direction:
 - 1. Vertical on doors, horizontal on drawer fronts.
 - 2. Lengthwise on face frame members.
 - 3. Vertical on end panels.
 - 4. Side to side on bottoms and tops of units.
 - 5. Vertical on knee-space panels.
 - 6. Horizontal on aprons.
- F. Exposed Materials:
 - 1. Plywood:
 - a. Maple Plywood: White Maple, Grade AA, rotary cut, book matched, crossbanded, with solid hardwood core.
 - 1) 1/4 inch: Minimum 3-ply.
 - 2) 3/4 inch: Minimum 7-ply.
 - b. Other Hardwood Plywood: Sound grade; cross-banded, with solid hardwood core.
 - 1) 1/4 inch: Minimum 3-ply.
 - 2) 3/4 inch: Minimum 7-ply.

2. Solid Wood: Clear hardwood lumber of species indicated and selected for grain and color compatible with exposed plywood.

G. Semi-exposed Materials:

- 1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed wood.
- 2. Plywood: Hardwood plywood of same species as exposed wood. Provide backs of same species as faces.
- 3. Provide solid wood or hardwood plywood for semi-exposed surfaces unless otherwise indicated.
- 4. Hardboard: Use only for cabinet backs where exterior side of back is not exposed.
- H. Hardboard: Full tempered 2 sides, consisting of steam-exploded wood fibers, highly compressed into hard, dense 1/4-inch thick homogeneous sheet using natural resins and other added binders; providing following physical properties:
 - 1. Modulus of Rupture: 5,000 PSI
 - 2. Density: 56 PCF
 - 3. Internal Bond:100.0 PSI
- I. Particleboard: Industrial grade meeting or exceeding CS 236-66 and ASTM D1037 with following physical properties:
 - 1. Density:.......47 PCF (+10 percent)
 - 2. Interior Bond: 60 PSI

 - 5. Screw Holding Power Face: 225 lbs.
 - 6. Screw Holding Power Edge:....200 lbs

2.4 MATERIALS

- A. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
- B. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.
- C. Marine Grade Hardwood Plywood: typical for all countertop applications.
- D. Softwood Plywood: U.S. Department of Commerce (DOC) PS 1.
- E. Particleboard: ANSI A208.1, Grade M-2.
- F. MDF: ANSI A208.2, Grade 130.
- G. Hardboard: ANSI A135.4, Class 1 Tempered.
- H. Edge banding: Minimum 1/8-inch- thick, solid wood of same species as face veneer
 - 1. Select wood edge banding for grain and color compatible with face veneers.
 - 2. Colors: As selected by Architect from manufacturer's full range.

- I. Countertop Solid surface material: Provide countertops with the following front and backsplash style: 1/2-inch thick, solid surface material Splashes: 1/2-inch thick, solid surface material. Fabrication: Fabricate tops in one piece on marine grade plywood with shop-applied edges unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing. Solid Surface Material: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1, Class A.
 - 1. Fabricate with loose splashes for field assembly.
 - 2. Adhesives: Adhesives shall not contain urea formaldehyde.
 - 3. 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. Hanex Solid Surfaces.
 - b. Corian
 - c. Formica Corporation.
 - d. Wilsonart International.
 - 4. Colors and Patterns: As selected by Architect from manufacturer's full range.
- J. Solid Surface windowsills and aprons:
 - 1. Solid-Surfacing Material Thickness: 1/2-inch.
 - 2. Fabrication: Fabricate stools and aprons in one piece, unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing
 - 3. Adhesives: Adhesives shall not contain urea formaldehyde.
 - 4. 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. Hanex Solid Surfaces
 - b. Corian
 - c. Formica Corporation.
 - d. Wilsonart International.
 - 5. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.5 FABRICATION

- A. Base Cabinet Construction:
 - 1. Tops: Horizontal frame with pinned mortise and tenon joints; joined to cabinet side with 8-mm hardwood dowels on 32-mm centers. Includes 1-1/8-inch thick x 1-3/4-inch deep front rail with 3/4-inch thick x 1-1/4-inch deep side rails and 3/4-inch thick x 1-3/4-inch deep back rail.

- 2. Divider Under Drawers: 3/4-inch thick x 2-1/4-inch deep front cross rail, secured to cabinet sides with 8-mm hardwood dowels on 32-mm centers. On all-drawer cabinets where locks are indicated, hardboard panel fitted in intermediate horizontal frame and placed between drawers to prevent access to other drawers.
- 3. Bottoms: 3/4-inch thick 7-ply hardwood plywood, let into 1-1/8-inch thick x 1-3/4-inch deep bottom rail and jointed to cabinet sides with 8-mm hardwood dowels on 32-mm centers.
- 4. Sub-Base: Separate and continuous (no cabinet body sides-to-floor), water resistant exterior grade plywood with concealed fastening to cabinet bottom. Ladder-type construction of front, back and intermediates to form a secure and level platform to which cabinets attach. Provide on surface of subbase, at exposed sides and ends, material to match cabinet material to ensure continuity where rubber base height many not cover due to floor shim. Typical
- 5. Tops, Dividers Under Drawers, and Bottoms: Securely glued and screwed under pressure to sides at assembly to ensure joint integrity and squareness.
- 6. Sides: 3/4-inch thick 7-ply hardwood plywood, faced with selected hardwood veneer for exposed surfaces and unselected but sound veneers for unexposed surfaces. Includes 3/8-inch thick hardwood nosing applied to exposed front edge of cabinet side. Where adjustable shelves required by specified manufacturer's catalog numbers, sides bored with 5 mm holes.
- 7. Backs: 1/4-inch thick tempered hardboard secured to cabinet top and bottom and dadoed into cabinet sides. Backs recessed 5/16-inch to permit accurate scribing to wall.
- 8. Removable Backs: Where indicated by specified manufacturer's catalog numbers, backs retained in vertical cleats secured to cabinet sides to provide tight joints and convenient access to plumbing.
- 9. Shelves: 1-inch thick 9-ply hardwood plywood with 3/8-inch solid lumber edge band front edges. Additional support provided at rear of cabinets 36 inches and wider.
- 10. Toe Space: 4-inches high x 3-1/4-inches deep with 3/4-inch thick x 4-inch high toe board, joined between cabinet sides with 8 mm hardwood dowels.
- 11. Drawers Semi-Flush Radius Lipped- White Maple:
 - a. Drawer Face: 3/4-inch thick solid lumber core, faced with selected hardwood veneer.
 - b. Sides and Back: 1/2-inch thick solid hardwood; dovetailed at front and rear.
 - c. Bottoms: 1/4-inch thick tempered hardboard fitted and secured into grooves in drawer face, sides and back.
 - d. Interior Finish: Sealed and varnished to resist absorption.

e. Slides: Side mount, epoxy-coated drawer slides, providing at least 100 lbs load capacity and incorporating positive stops. Provide progressive type slide with minimum 100 lbs load capacity for file drawers.

B. Wall Cabinet Construction:

- 1. Tops and Bottoms: 3/4-inch thick 7-ply hardwood plywood, let into 1-1/8-inch thick x 1-3/4-inch deep top and bottom rail and joined to cabinet sides with 8 mm hardwood dowels on 32 mm centers. Securely glued and screwed under pressure at sides to assembly to ensure joint integrity and unit squareness.
- 2. Sides: 3/4-inch thick 7-ply hardwood plywood, faced with selected hardwood veneer on exposed surfaces and unselected but sound veneer on unexposed surfaces. 3/8-inch thick hardwood nosing applied to exposed front edge of cabinet side. Where adjustable shelves required, 5 mm holes bored in sides on 32 mm centers.
- 3. Backs: 1/4-inch thick tempered hardboard secured to cabinet top and bottom, dadoed into cabinet sides, and recessed 5/16-inch to permit accurate scribing to wall.
- 4. Shelves: 1-inch thick 9-ply hardwood with 3/8-inch thick hardwood nosing on front edge. Shelves in 36-inch and wider cabinets include additional support at rear.

C. Cases:

- 1. Tops and Bottoms: 3/4-inch thick 7-ply hardwood plywood let into 1-1/8-inch thick x 1-3/4-inch deep top and bottom rail and joined to cabinet sides with 8 mm hardwood dowels on 32 mm centers. Tops and bottoms securely glued and screwed under pressure to sides at assembly to ensure joint integrity and unit squareness.
- 2. Sides: 3/4-inch thick 7-ply hardwood plywood, faced with selected hardwood veneer on exposed surfaces and unselected but sound veneers on unexposed surfaces. 3/8-inch thick hardwood nosing applied to front edge of cabinet side. When adjustable shelves required, 5 mm holes bored in sides.
- 3. Backs: 1/4-inch tempered hardboard secured to cabinet top and bottom, dadoed into cabinet sides, and recessed 5/16-inch to permit accurate scribing to wall.
- 4. Shelves: 3/4-inch thick 7-ply hardwood with 3/8-inch thick hardwood nosing on front edge. Shelves in 36-inch and wider cabinets include additional support at rear.
- 5. Toe Space: 4-inches high x 3-1/4-inches deep with 3/4-inch thick x 4-inch high toe board, joined between cabinet sides with 8 mm hardwood dowels.

D. Doors

- 1. Semi-Flush Radius Lipped Maple:
 - a. Base and Wall Cabinets: 3/4-inch thick solid core, banded on all edges and faced with selected hardwood veneer.
 - b. Tall Cases: 1-1/8-inch thick solid lumber core, banded on all edges and faced with selected hardwood veneer.

- 2. Hinged Glazed Doors: 1-1/8-inch thick x 2-3/4-inch wide heavy selected hardwood frame fitted with 1/4-inch tempered glass and equipped with same carriers specified for solid case doors above.
 - a. Wall and Base Cabinets: 3/4-inch thick x 2-3/4-inch wide selected hardwood frame fitted and equipped as specified for "Hinged Glazed Doors" above.
- E. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

2.6 FINISH

- A. Wood Finishes: Varnish providing tough, hard properties to withstand most severe conditions and staining agents imparting clean, translucent appearance to wood substrate and enhance and improve natural graining in face without suggestion of masking or hiding. Finished film provides mellow, smooth texture.
 - 1. Surface Preparation: All surfaces thoroughly sanded with fine abrasive not coarser than 3/0 Garnet finishing paper, achieving absolute cleanliness before finishing coat application. All wood flour and abrasive particles removed with dry compressed air and all areas wiped with tack rag.
 - 2. Sealing: Synthetic resin-based sealer applied to all surfaces of drawer, cabinet doors, exposed surface and other small sections where complete sealing of edges necessary to prevent moisture absorption. Remainder of cabinet sprayed with sealer after application to specific surfaces. Sealer air-dried within 20 minutes to permit light scuff sanding with 5/0 Garnet finishing paper and subsequently thoroughly dusted.
 - 3. Stain: Pigmented stain consisting of non-fading and non-bleeding colors, ground in suitable vehicle, permitting blending in proportions required to produce color selected by Architect from manufacturer's full range of standard and custom colors.
 - 4. Topcoat: Varnish consisting of moisture of chlorinated polymers and co-polymers suitably compounded with oil modified alkyd resin and other resinous plasticizers in solution of aromatic and oxygenated solvents. Produces cured film gloss with range of 40-50 measured by 60-degree gloss meter. Rubbed effect accomplished by inorganic flatting agent and acid catalyst added prior to spraying to convert film to cured state. Thorough sanding of previous coating provided to promote inter-coat adhesion with careful dusting to remove all powdered finish and abrasive prior to final coating.
 - 5. Chemical Resistance Properties Maple Wood Veneer Casework
 - a. Spot Test to Evaporation

1)	Boiling Water	No effect
2)		
3)	<u> </u>	
4)	1 17	
,	Xylol	
-	Talual	

',	тирши	
8)	Gasoline	No effect
9)	Methyl Ethyl Ketone	No effect
10)	Acetone	
11)	Chloroform	No effect
12)	Formaldehyde	No effect
13)	Ink	
Spot	Test for One Hour	
1)	25 percent Sulfuric Acid	No effect
2)	70 percent Sulfuric Acid	Film destroyed
3)	20 percent Hydrochloric Acid (5 min.)	No effect
4)	37 percent Hydrochloric Acid	Very slight ring & stain
5)	50 percent Nitric Acid	Film destroyed
6)	10 percent Sodium Hydroxide	No effect
7)	29 percent Ammonia	No effect
8)	Iodine	Slight stain
9)	Lipstick	No effect
10)	Crayon	No effect
11)	Catsup	No effect
12)	Butter	No effect
13)	Oleo	No effect
14)	Mustard	No effect
15)	Grape Juice	No effect
16)	Coke or Pepsi Cola	No effect
17)	Vinegar	No effect
18)	Milk	No effect

Naptha......No effect

c. Adhesion and Toughness: Attempts to separate various finish layers from each other and from wood with razor blade or sharp knife are extremely difficult or results in no separation of various layers.

2.7 CASEWORK HARDWARE AND ACCESSORIES

7)

b.

- A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware.
 - 1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard, except where hardware is through bolted from back side.
- B. Butt Hinges: Wrap-around type, 5-knuckle pin, heavy-duty institutional type with rounded ends, finished in either brushed chrome or black as directed by Architect and concealing hinge screws when door closed.
 - 1. Lipped Construction: 2-1/2-inches high x 0.072-inch thick.
 - 2. Offset kitchen cabinet type, plain butt hinges or hinges with removable pins not acceptable.
 - 3. 2 hinges provided on doors less than 44 inches high; 3 hinges provided on doors 44 inches high and higher.

- C. Pulls: Solid chrome-plated brass wire pulls, fastened from back with two screws. Provide two pulls for drawers more than 24 inches wide.
- D. Door Catches: nylon-roller spring catch or dual, self-aligning, permanent magnet catch. Provide two catches on doors more than 48 inches high.
- E. Drawer Slides: BHMA A156.9, Type B05091.
 - 1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted and extending under the bottom edge of drawer; full -extension type; zinc-plated epoxy-coated steel with polymer rollers.
 - 2. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-overtravel-extension type; zinc-plated, steel ball-bearing slides.
 - 3. Box Drawer Slides: Grade 1HD-100, for drawers not more than 6 inches high and 24 inches wide.
 - 4. File Drawer Slides: Grade 1HD-200, for drawers more than 6 inches high or 24 inches wide.
- F. Drawer and Hinged Door Locks: Cylindrical (cam) type, five-pin tumbler, brass with chrome-plated finish, and complying with BHMA A156.11, Grade 1.
 - 1. Provide a minimum of two keys per lock and six master keys.
 - 2. Provide locks on all doors and drawers.
- G. Adjustable Shelf Supports: Two-pin-locking plastic shelf rests complying with BHMA A156.9, Type B04013.
- H. Adjustable Wall Shelf Supports: Surface-type steel standards and steel shelf brackets, with epoxy powder-coated finish, complying with BHMA A156.9, Types B04102 and B04112.
- I. Countertop Support: type and style as called out on drawings.
- J. Grilles: Continuous satin aluminum finished countertop grille and toe-kick grille for air filtration at fin tube locations and as shown on Drawings similar to "Model #CT-PP-3 (c'top)/ #CT-PP-0 (toe)Linear Diffuser" by Titus.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 CASEWORK INSTALLATION

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Install casework level, plumb, and true; shim as required, using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- C. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.
- D. Base Cabinets: Adjust top rails and subtops within 1/16 inch of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches o.c. Fasten adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch.
 - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than 2 fasteners per side.
- E. Wall Cabinets: Adjust fronts and bottoms within 1/16 inch of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches o.c. Align similar adjoining doors to a tolerance of 1/16 inch.
- F. Fasten cabinets to adjacent cabinets and to masonry, framing, wood blocking, or reinforcements in walls and partitions to comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."
- G. Install hardware uniformly and precisely. Set hinges snug and flat in mortises unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- H. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 CLEANING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- C. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at minimum of 48 inches o.c.

END OF SECTION 12 32 13

SECTION 12 32 16 - MANUFACTURED PLASTIC-LAMINATE-FACED CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes plastic-laminate panel sheet.

1.3 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that casework can be supported and installed as indicated.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Plastic laminate samples.
 - 2. Product data.
- B. Shop Drawings: Include plans, elevations, details, and attachments, show installation details. Indicate manufacturer's catalog numbers for casework.
 - 1. Color/Finishes: Shop drawings are not to include colors, wood finishes, stains, etc. All colors are to be selected by the Architect and issued to the contractor by an ASI during the construction phase.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework 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. Maintain temperature and relative humidity during the remainder of the construction period in range recommended for Project location by the AWI's, "Architectural Woodwork Standards."
- B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

C. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.

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:
- B. Basis-of-Design Product: Subject to compliance with requirements, drawings and specifications are based on products manufactured by TMI SYSTEMS CORPORATION, 50 South Third Avenue West, Dickinson, ND or comparable product by one of the following:
 - 1. TMI Systems Corporation.
 - 2. Case Systems Inc.
 - 3. Other manufacturers shall comply with the minimum levels of material and quality as indicated on the drawings or as specified.
- C. Source Limitations: Obtain laminate clad items including casework, countertops, and architectural woodwork from the same casework supplier to establish single responsibility for all laminated and related components.

2.2 LAMINATE PANEL, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" for grades of casework indicated for construction, finishes, installation, and other requirements.
 - 1. Grade: Premium
 - 2. Provide labels and certificates from AWI certification program indicating that casework, including installation, complies with requirements of grades specified.
- B. Minimum Component Flammability Requirements: Provide casework with components meeting the following requirements to achieve minimum of "Class C" rating per ASTM E84:

		Flame Spread Index	Smoke Developed Index
1.	High Pressure Laminate Exterior Bonded to High Performance Particleboard Core Material	: 76-200	0-450

2.3 PLASTIC LAMINATE - SHEET

- A. Exposed Surface:
 - 1. Plastic Laminate: Grade VGS (0.028" Thickness)
 - a. Colors and Patterns: As selected by Architect from manufacturer's full range

b. For exterior cabinet surfaces, interior of open cabinets, and interior of glass door cabinets

2.4 MATERIALS

- A. Laminate Manufacturers: Up to 5 different colors (1 color per unit face) as selected by Architect from manufacturer's full range of standard (non-premium) color and finish options including patterns, solid colors, and woodgrain laminates from each manufacturer listed below:
 - 1. Wilsonart International.
 - 2. Formica.
 - 3. Panolam (Nevamar & Pionite).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 CLEANING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 12 32 16

SECTION 12 56 51 - LIBRARY FURNITURE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood-case library shelving.

1.3 SUBMITTALS, GENERAL

A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for library furniture and accessories.
 - 1. Wood-case shelving.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and details.
 - 2. Show clear-aisle widths from face of units.
 - 3. Detail fabrication and installation of library shelving systems including methods of anchoring to building structure at locations recommended by manufacturer.
- C. Samples for Initial Selection: For units with factory-applied finishes, 6 inches in size.
- D. Samples for Verification: For the following products:
 - 1. One full-size finished section of wood-faced circulation desk assembly complete with hardware, doors, and drawers; including countertop.

1.5 INFORMATIONAL SUBMITTALS

- A. Seismic Design Calculations: For seismic design of library shelving systems including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Qualification Data: For Installer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For library stack systems to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Source Limitations: Obtain library furniture through one source from a single manufacturer, unless noted otherwise.
- C. Fire-Test-Response Characteristics of Upholstered Chairs:
 - 1. Fabric: Class 1 according to U.S. Department of Commerce (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.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of library furniture and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
 - 1. Do not modify requirements, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver library furniture only after painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate library furniture have been completed in installation areas. If library furniture must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified in "Project Conditions" Article.
- B. Keep finished surfaces covered with polyethylene film or other protective covering during handling and installation.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install library furniture until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Verify actual dimensions of construction contiguous with library furniture by field measurements before fabrication. Indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Library shelving systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 WOOD-CASE SHELVING

- A. Wood-Case Library Shelving: Shelving designed for library use and consisting of base frame and full end, top, and back panels, with end panels made to receive pins to support adjustable shelves.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Worden Company; Pin-Fast Shelving or comparable product.
- B. Wood Case Library Shelving: Shelving designed for library use and consisting of full end, top, and back panels, with end panels made to receive pins to support adjustable shelves.
 - 1. Configuration: Starter/adder units.
- C. Vertical Panels: Panels consisting of lumber-core veneer panels, 1-inch-thick, with solid-wood banding. Provide two rows of 8 mm holes at 32 mm intervals for shelf support pins on one side of end panels and both sides of intermediate panels.
- D. Base Frames: Lumber-core veneer panel external toe kick; particleboard with thermally fused melamine internal and back toe kicks; 4 inches high; designed to support bottom shelf and fabricated to attach and tie together vertical panels.
- E. Wood Shelves: Panels consisting of solid hardwood boards glued together, 3/4-inch-thick, with 2-inch solid-wood nosing strip, and grooved on underside to rest securely on supporting pins.
- F. Cornice Tops: 3/4-inch-thick, particleboard-core veneer panel banded with solid hardwood fasciae on one side for single-faced units and on two sides for double-faced units, fabricated to attach and tie together vertical panels.
- G. Back panels: Veneer-core, veneer-faced panels, 1/4-inch-thick.
- H. Bookstack Units:
 - 1. Type: Single faced units.
 - 2. Width: 36 inches-or as shown modified.
 - 3. Height and Number of Shelves:
 - a. 30 inches; two adjustable shelves; one base shelf.
 - b. 42 inches; three adjustable shelves; one base shelf.
 - 4. Shelf Depth: 12 inches nominal.

5. Shelf Style:

- a. Flat, unless noted otherwise.
- b. Adjustable divider; where indicated.
 - 1) Notch shelf bottom for dividers.
- c. Pivot type periodical; for use in 12-inch-deep units, where indicated.
 - 1) Provide retaining rail, and adjustable pins for access to stored back issues.
- d. Hinged periodical; for use in 16-inch-deep units, where indicated.
 - 1) Provide retaining rail and allow for shelves to be self-storing in open position.

I. Bookstack Units:

- 1. Type: Double faced units- 24" deep, movable.
- 2. Width: 36 inches.
- 3. Height and Number of Shelves:
 - a. 42 inches; three adjustable shelves; one base shelf.
- 4. Shelf Depth: 12 inches nominal.
- 5. Shelf Style:
 - a. Flat, unless noted otherwise.
 - b. Mobile- provide sections with heavy duty locking casters.
 - c. Adjustable divider; where indicated.
 - 1) Notch shelf bottom for dividers.
 - d. Pivot type periodical; for use in 12-inch-deep units, where indicated.
 - 1) Provide retaining rail, and adjustable pins for access to stored back issues.
 - e. Hinged periodical; for use in 16-inch-deep units, where indicated.
 - 1) Provide retaining rail, and allow for shelves to be self-storing in open position.

I. Accessories:

- 1. Adjustable Shelf Dividers: One-piece shelf partitions, with hooks or tabs to fit in slots in divider shelves.
 - a. Provide three per adjustable divider shelf.

2.3 STRUCTURAL SUPPORT

A. Wall Anchorage: Manufacturer's standard, galvanized steel anchor designed to secure shelving to adjacent wall. Provide one per shelving unit for each shelving unit adjacent to a wall.

2.4 GENERAL FINISH REQUIREMENTS

A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 WOOD FINISHES

- A. Preparation: Sand wood units after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.
- B. Staining: Remove fibers and dust and apply wash-coat sealer and stain to exposed and semi exposed surfaces as required to provide uniform color and to match approved samples.
- C. Finishing: Apply manufacturer's standard, baked, clear finish consisting of a sealer and a conversion varnish or nitro cellulous lacquer topcoat. Sand and wipe clean between applications of sealer and topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of library stack systems.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Vacuum finished floor and wet mop resilient flooring over which shelving is to be installed.
- B. Before installing wood-case shelving], condition materials to average prevailing humidity in installation areas for a minimum of 48 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, WOOD CASE LIBRARY SHELVING

- A. Install library shelving systems at locations indicated on Drawings and according to manufacturer's written instructions.
- B. Level units with integral adjustable leveling devices to a tolerance of 1/8 inch in 96 inches for level and plumb.
- C. Install using anchorage or bracing as recommended by manufacturer and as required for stability.
- D. Install the following with concealed fasteners:
 - 1. End panels.
 - 2. Canopy tops- solid surface.
- E. Install shelves at equal spacing in each unit.

3.4 CLEANING AND PROTECTING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- C. Protect installed products from damage during remainder of the construction period.

END OF SECTION 12 56 51