PROJECT MANUAL / SPECIFICATIONS FOR

TUCKAHOE MIDDLE SCHOOL HIGH SCHOOL RECONSTRUCTION 65 Siwanoy Blvd. Eastchester, NY 10709

NY SED Project Control No: 66-03-02-03-0-002-024 KG+D Project No: 2021-1053

TUCKAHOE UNION FREE SCHOOL DISTRICT 65 Siwanoy Blvd. Eastchester, NY 10709

ARCHITECT:

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

SYSTEMS ENGINEER:

OLA CONSULTING ENGINEERS, P.C. 50 Broadway Hawthorne, NY 10532

STRUCTURAL ENGINEER:

ASBESTOS DESIGNER:

SPECIFICATIONS:

THE DISALVO ENGINEERING GROUP 83 Wooster Heights Road, Suite 200 Danbury, CT 06810

OMEGA ENVIRONMENTAL SERVICES, INC. 280 Huyler Street South Hackensack, NJ 07606

SUE MCCLYMONDS 2 Robb Road Amsterdam, NY 12010

CONSTRUCTION DOCUMENTS

31 March 2022

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ADVERTISEMENT FOR BIDS

<u>The Tuckahoe Union Free School District</u> will receive individual sealed proposals before 2:00 pm, on Thursday, April 28, 2022 for

Tuckahoe Middle School/High School 65 Siwanoy Boulevard Eastchester, NY 10709 Bid #100-24

The Tuckahoe Union Free School District will receive proposals at the District Business Office, 65 Siwanoy Boulevard, Eastchester, NY, 10709, and at that time and place any and all such proposals that have been received in accordance with the terms hereof will be publicly opened and read aloud.

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

Bid Package	<u>Trade</u>
1	General Construction
2	HVAC
3	Electrical

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

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

Bidders may obtain the Bid Documents **after 2:00 PM**, **on Friday**, **April 1**, **2022**, from REV, 330 Route 17A, Goshen, NY, 10924, 877.272.0216. Complete digital sets of Bidding Documents, drawings and specifications, may be obtained online as a download at the following website: <u>www.usinglesspaper.com</u> under 'Public Projects.' Complete hard copy sets of Bid Documents, drawings and specifications, may be obtained upon depositing the sum of \$100 for each combined set of documents. Checks or money orders shall be made payable to Tuckahoe Union Free School District. Plan deposit is refundable in accordance with the terms in the Instructions to Bidders to all submitting bids. Any bidder requiring documents to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs.

Please note Rev (<u>www.usinglesspaper.com</u>) is the designated location and means for distributing and obtaining all bid package information. All bidders are urged to register to ensure receipt of all necessary information, including Bid Addenda.

There will be a pre-bid site meeting on **Thursday**, **April 7**, **2022**, **at 3:30 PM**, at Tuckahoe Middle/High School main front entry. **Bidders are urged to attend the site meeting**. **Knowledge of the field conditions is crucial to understanding the Work**.

Any proposal must be accompanied by a certified check payable to the Tuckahoe Union Free School District or by a Bid Bond for a sum equal to five percent (5%) of the bid, conditioned as set forth in the Instructions to Bidders.

All bid security, except those of the three low bidders will be returned within four days after proposals are submitted. The bid security provided by the three low bidders will be returned after the execution of the Trade Contract.

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

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

All Requests for Information must be sent in writing using the RFI form in the Bid Documents to the Architect via fax (914-666-0051) or email (<u>rfendler@kgdarchitects.com</u>) no later than 4:00 PM, **Wednesday, April 20, 2022**, and will be responded to via Addendum by **Monday, April 25, 2022**

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

Tuckahoe Union Free School District Renovations at Tuckahoe Middle/High School Opening Date: Thursday, April 28, 2022 at 2 pm Bid # 100-24 Name of Bidder "SEALED BID"

Any proposal must be delivered to Faith Sparks, Business Manager, or her designee, no later than the appointed time on the bid opening date, at the District Business Office, 65 Siwanoy Blvd, Tuckahoe, NY, 10709. The District will not open or consider any proposal unless it is received at that location by no later than the appointed time on the bid opening date. Bidders are solely responsible for the arrival of each bid proposal at the place of bid opening by the appointed time, regardless of the means of delivery.

END OF ADVERTISEMENT

SECTION 002100

INVITATION AND INSTRUCTIONS TO BIDDERS

1.01 OWNER, PROJECT, ARCHITECT, BID PROCEDURE

- A. The Owner, Tuckahoe Union Free District; located at 65 Siwanoy Blvd, Eastchester, NY 10709 invites sealed bids for Middle School/High School Reconstruction located at 65 Siwanoy Blvd, Eastchester, NY 10709 all as described in the accompanying contract documents as prepared by Kaeyer, Garment and Davidson Architects, P.C. located at 285 Main Street; Mt. Kisco, NY 10549.
- B. Bids shall be received in accordance with the New York State Public Bidding Laws, this project will be executed under MULTIPLE CONTRACTS as noted below:
 - Contract #1 General Construction
 - Contract #2 HVAC
 - Contract #3 Electrical
- C. The attention of all bidders is directed to the fact that a single set of documents exist for the construction of the Project as a whole. Work on each sheet, or within any technical specification section may or may not have an effect on the work of any single Contractor. Failure on the part of any Contractor to examine all documents will not be cause for additional cost to the Owner.
- 1.02 DISCREPANCY
 - A. Should any bidder find any discrepancies in, or omission from, the Contract Documents, or should the bidder be in doubt as to the meaning of any portion of said documents, they shall at once notify the Architect and obtain an interpretation or clarification prior to submission of their bid.
 - B. <u>Any request for interpretation or clarification given in accordance with this provision</u> <u>shall be in writing</u>.
 - C. The bidder may, during the bidding period, be advised by addendum of additions, deletions, or alterations in any of the documents forming a part of this Contract. All such additions, deletions or alterations shall be included in the work covered by the bid and shall become a part of this Contract.

Upon such mailing or delivery and making available for inspection, such addendum shall become a part of the Contract Documents and shall be binding on all Bidders whether or not the Bidder receives or acknowledges the actual notice of such addendum.

The requirements contained in all Contract Documents shall apply to all addenda.

CUTOFF DATE FOR RECEIPT OF REQUESTS FOR INFORMATION (RFI'S) SHALL BE 5 WORKING DAYS PRIOR TO DESIGNATED DATE FOR RECEIPT OF BIDS.

D. Only interpretations, corrections or additional Contract provisions made in writing by the Architect as addenda shall be binding. No officer, agent or employee of the Owner or the Architect is authorized to explain or to interpret the Contract Documents by any other method and any such explanation or interpretation, if given,

shall not be relied upon by the Bidder.

- 1.03 REPRESENTATION Each bidder, by making their bid, represents that -
 - A. They have read and understands the Bidding Documents (consisting of the Project Manual, Drawings and Addenda (if any)) and their Bid is made in accordance therewith.
 - B. They have visited the site and have familiarized themselves with the conditions under which the work is to be performed.
 - C. All materials to be incorporated in the work shall be "asbestos free" in their manufacture.
- 1.04 DOCUMENTS
 - A. Bidders may obtain the Bid Documents after 2:00 PM on Friday April 1, 2022, from REV, 330 Route 17A, Goshen, New York 10924 Tel: 1-877-272-0216. Complete digital sets of Bidding Documents, drawings and specifications, may be obtained online as a download at the following website: www.usinglesspaper.com under 'public projects.' Complete hard copy sets of Bidding Documents, drawings and specifications, may be obtained upon depositing the sum of \$100 for each combined set of documents. Checks or money orders shall be made payable to Tuckahoe Union Free School District. Plan deposit is refundable in accordance with the terms in the Instructions to Bidders to all submitting bids. Any bidder requiring documents to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs.
 - B. Please note REV (<u>www.usinglesspaper.com</u>) is the designated location and means for distributing and obtaining all bid package information. All bidders are urged to register to ensure receipt of all necessary information, including bid addenda.
- 1.05 INFORMATIONAL MEETING All bidders are advised that an informational meeting will be held as follows:
 - A. Date Thursday, April 7, 2022
 - B. Local Prevailing Time 3:30 PM
 - C. Location Middle School/High School Main Entrance
 - D. Any and all questions that may arise as a result of this meeting will be recorded and answered by the Addendum process.

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

- 1.06 BIDDING
 - A. Sealed bids, with the name and address of the Bidder contained thereon, will be received at the District Office, 65 Siwanoy Blvd, Eastchester, NY 10709 on or before Thursday, April 28, 2022 until 2:00 P.M., Local Prevailing Time at which time all bids will be opened publicly and read aloud.
 - B. All bids shall be submitted in duplicate on the Proposal Forms provided within the specifications and shall be submitted in an opaque sealed envelope with the following contained thereon:

- 1. Project Name.
- 2. Contract Number.
- 3. Type of Construction.
- 4. Name of Bidder.
- 5. Mark "SEALED BID".
- C. All spaces on Proposal Form must be completed. All signatures shall be in ink and in longhand.
- D. No oral or telephonic proposals or modifications of proposals will be considered.
- E. Any proposals containing exceptions or modifications may, at the Owner's option, be disqualified.
- 1.07 QUALIFICATIONS OF BIDDER
 - A. The Owner may make such investigation as the Owner deems necessary to determine the responsibility of any Bidder or to determine the ability of any Bidder to perform the Work.
 - B. Bidders shall furnish to the Owner all information and data required by the Owner, including complete financial data, within the time and in the form and manner required by the Owner.
 - C. The Owner reserves the right to reject any bid if the evidence required by the Owner is not submitted as required or if the evidence submitted by or the investigation of any Bidder fails to satisfy the Owner that the Bidder is responsible or is able or qualified to carry out the obligations of the Contract or to complete the Work as contemplated.
- 1.08 POST BID PROCEDURES
 - A. The responsibility of bidders and of their proposed subcontractors will be considered in making the award. The Owner through the Architect may make such investigation as the Owner deems necessary to determine the responsibility of any bidder or to determine the ability of any bidder to perform the Work.
 - B. When requested by the Architect, bidders shall furnish all information and data required by the Owner, including financial data, within the time and in the form and manner required by the Owner. Upon notification from the Architect, the three apparent low bidders shall furnish within three (3) working days after the bid opening four (4) copies of the following information in writing:
 - 1. a signed and notarized bidder qualification statement (see Section 00 45 13);
 - 2. the names, addresses and phone numbers of the subcontractors and suppliers that the bidder proposes to use on the project;
 - 3. the bidder's proposed site safety plan;
 - 4. a bar chart (see paragraph 1.03, Section 013200 of the General Requirements) showing the bidders' proposed plan and schedule to complete the bidder's work in accordance with the phasing milestones outlined in Section 01 10 00;
 - 5. the insurance certificates required by the Bid Documents;
 - 6. a proposed schedule of values for the bidder's work;
 - 7. a proposed list of submittals and a proposed schedule for making them, all keyed to the bar chart.
 - C. After receipt of the above information, the Architect will designate a time and place for a meeting between the Owner, the Architect and the apparent low bidder. The apparent low bidder's principal, project manager and site superintendent will attend that meeting, at which time the parties will discuss the bidder's responsiveness,

responsibility and qualifications.

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

1.09 APPROVAL OF SUBCONTRACTORS

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

1.10 SECURITY AND BONDS (Coordinate with Section 006100)

- A. Every bid shall be accompanied by a Bid Bond in the amount of 5 percent of the Contract Sum drawn by a recognized surety authorized to conduct business in the State of New York and made payable to the Owner.
 - 1. Bid Security shall be submitted in a separate sealed envelope clearly identifying the company and project as well as the name and address of the Surety Company.
 - 2. Each Bond must be accompanied by a Power of Attorney, giving names of Attorneys-in-fact, and the extent of their bonding authority. All bonds shall be countersigned by a resident Agent and with a Surety Company or Corporation meeting the following qualifications:
 - a. Surety must be licensed to do business in the State of New York.
 - b. Surety shall be listed on the current U.S. Treasury Department Circular 570 entitled "Companies Holding Certificates of Authority" from the Secretary of the Treasury under the Act of Congress approved July, 30, 1974 (6 U.S.C., Sec. 6-13), as Acceptable Sureties on Federal Bonds.

- c. Surety must meet minimum rating requirements as published in current "Best's Key Rating Guide" as listed in the attachment to Section 00 61 00.
- d. Limitations:
 - Bonding limits or bonding capacity refers to the limit or amount of bond acceptable on any one project.
 - The bonding limit for each contractor shall not exceed the amount listed on the above referenced U.S. Treasury Department List for the Surety issuing the bond.
- e. All Surety companies are subject to approval and may be rejected by the Owner without cause, in the same manner that bids may be rejected.
- f. Compliance: In the event any of the requirements outlined herein are not complied with, the Owner shall have the right to reject the bid or annul the Award of the Contract.
- B. Bid security will be returned to all except the three lowest bidders, after formal analysis and evaluation of bids. No bid will be withheld beyond the forty-five (45) day period stipulated above.
- C. Remaining bid security will be returned to bidders after Owner and successful bidder have executed the Agreement and the Owner has received and approved performance and payment bonds.
- D. If the required agreement has not been executed within the specified period of time after the bid opening, bid security of any bidder will be returned upon his request, provided he has not been notified of acceptance of his bid prior to the date of his request.
- E. Separate Performance and Payment Bonds will be required for the work. Each shall be in the amount of 100% of the Contract price.
- F. The Contractors shall include in their proposal amounts the total premiums for the performance and labor and material payment bonds as set forth in Section 00 61 00.
- 1.11 TAX STATUS (Coordinate with Article 3.6 of Section 00 70 00 (AIA A232)
 - A. The Owner, Tuckahoe Union Free School District, is an educational non-profit institution and is therefore "tax-exempt" in accordance with the applicable laws of the State of New York and with Chapter 32 of the Internal Revenue Code, as most recently amended, for collection of all sales and excise taxes.
 - B. Exemption Certificates will be furnished to each Respective Prime Contractor.
- 1.12 INSURANCE
 - A. Insurance as required by Article 11 of the General Conditions and as set forth in the Insurance Rider (Section 00 70 02) shall be required of each Respective Prime Contractor and shall be of forms and limits required therein.
- 1.13 EQUIVALENCY CLAUSE (Coordinate with Section 01 25 00)
 - A. When in the project manual/specifications, two or more kinds, types, brands, or manufacturers of materials are named they are regarded as establishing the required standard of quality and not for the purpose of limiting competition.
 - B. The contractor may select one of these items or, if the contractor desires to use any kind, type, brand, manufacturer or material other than those named in the specification, he shall, in accordance with the instructions set forth in "Post-Bid

Requirements" herein, identify within three (3) days after bid submission, but in any event prior to award of contract, what kind, type, brand, or manufacturer is included in the base bid for the specified item following procedures set forth in Section 012500.

C. Failure to so identify the perceived "equivalencies", will not relieve contractor from providing the specified items.

1.14 AWARD OF CONTRACT

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

1.15 LAWS AND REGULATIONS

- A. All applicable Federal, State, County, Municipal or other laws, orders, ordinances, rules and regulations of all Authorities having jurisdiction over construction work in the locality of the project shall apply to the Contract and shall be deemed to be included in the Contract as if fully set forth therein at length.
- B. This project is subject to wage determination as issued by the Department of Labor. Reference Section 004643.
- C. In accordance with the requirements of General Municipal Law §103-g, the bidder is required to include with its bid either (1) the "Certification of Compliance with the Iran Divestment Act" or, in the case where the bidder is unable to make such certification, (2) the form titled "Declaration of Bidder's Inability to Provide Certification of Compliance with the Iran Divestment Act".

1.16 ARREARS

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

1.17 NONDISCRIMINATION

A. Notwithstanding implementation of the Owner's Affirmative Action Plan, if any, all Contractors and Subcontractors of all tiers and vendors will be required to comply with all provisions of the Civil Rights Act of 1964, Executive Order 11246 of 24

September 1965 and the relevant "Laws", "Acts" rules, regulations and orders of the Labor Department of the State of New York as amended.

B. Liquidated Damages may be assessed for each and every calendar day that the work is not complete, after the above stated time for total completion of the work at the rates established in the General Conditions, Section 007000.

End of Invitation and Instructions

INFORMATION AVAILABLE TO BIDDERS

1.1 GENERAL

A. Hazardous Material Information: Data in hazardous material investigation reports included herein are provided to the Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between sampling locations. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.

Please Note: This report is for the gymnasium area only. All other areas where the Work occurs have been tested and the results are negative for asbestos-containing materials.



ASBESTOS BULK SAMPLING & ANALYSIS REPORT [Omega Project #22-1037]

CLIENT NAME/ADDRESS:	Robert Fendler Kaeyer, Garment & Davidson Architects 285 Main Street Mt. Kisco, NY 10549-3024	s, PC
SITE/BUILDING:	Tuckahoe Middle and High School 2 Siwanoy Boulevard Eastchester, NY 10709	
LEVEL/ROOM/AREA:	Gym (Accessible Materials Only)	
SURVEY DATE:	1/22 & 2/24/2022	
REPORT DATE:	3/28/2022 (Amended 3/28/2022)	
PURPOSE OF ASBESTOS BULK SAMPLING:	Pre-Renovation	
SURVEY SCOPE:	Full Access (y/n)YeAccessible Materials Only (y/n)YeProbe Cuts (y/n)NeConcealed Materials (y/n)YeDrawing Provided (y/n)YePW-1 (NYC only)Ne	es O es es
INSPECTOR/INVESTIGATOR:	Name: Eddy Montoya, Gboyega Adewuy Anton Rezin Signature: <u>Advantory</u> <u>Hala</u> License #: 153271/13-12147, 148488/11 & 91-05296	BY.
PROJECT MANAGER:	Name/Signature:	
REPORT QC BY:	Name: Veronica Kero, CIH, P.E.	
SUMMARY OF FINDINGS:	Asbestos Delineated (y/n) Ye	es

SAMPLING LIMITATIONS/CONDITIONS:

It is important to note that all asbestos containing materials (ACM) may not be delineated during one single sampling event. Frequently, as a project progresses and wall/ceilings, equipment, and other concealed areas are exposed, additional bulk sampling may potentially be required.

The following limitations/exclusions apply:

- 1. Asbestos bulk sampling report should not be used as sole reference source to determine Contractor scope of work additional field coordination required in order to generate "Abatement Work Plan".
- 2. If scope of renovation changes, and/or walls/ceilings/chases/flooring opened, then additional asbestos bulk sampling required at a later date.
- 3. Until selective demolition is performed, all concealed materials cannot be viewed or accessed for sampling.
- 4. All sampling is representative in nature and does not reflect every square inch of material.
- 5. Roof/façade sampling: Roof leaks may occur as a result of roof bulk sampling. Omega will utilize temporary roof patch; however, since Omega is not a professional roofer, we cannot make guarantees or maintain warrantees against roof leakage.
- 6. Findings are representative of site conditions on day of investigation.
- 7. Subject survey conducted according to published regulations in effect on survey date.

Building/Area Description:

The subject building would be described as an educational facility.

The bulk sampling was performed in the entire school.

Asbestos Sample Analysis Methods and Sample Count:

- *PLM by EPA 600/M4/82/080* and *NYS 198.1*(friable):
- TEM-NOB by NYS ELAP 198.4 (non-friable):
- PLM-NOB by NYS ELAP 198.6 (non-friable):
- VC-SOF by NYS ELAP 198.8 method

Bulk samples were submitted to ELAP accredited Laboratory Testing Services/accreditation #10955 utilizing sealed chain-of-custody procedures.

Definitions:

ACM: asbestos containing material RACM: regulated asbestos containing material VCM: vermiculite containing material TSI: thermal system insulation (pipe insulation) SSI: surfacing material (spray-on fireproofing, plaster, etc.) Miscellaneous finish material: sheetrock, floor tile, roofing, other NOB: non-organically bound non-friable material (e.g. roofing, floor tile, etc.) Significantly damaged: 20% or more of asbestos surfacing material has visible damage. Damaged: less than 20% or asbestos surfacing material has visible damage is scattered such that less than 20% of total surface area impacted. No visible damage: no visible damage noted.

samples collected 78# samples collected 42# samples collected 42# samples collected 0

Criteria for Positive Classification as Regulated Asbestos Containing Material (RACM):

Asbestos containing material (ACM)

The EPA defines ACM as any material having an Asbestos content greater than 1%. If the analytical results for any sample of suspected material indicate that asbestos is present above a level of one percent, the building material is classified as regulated ACM (RACM) which triggers management and/or abatement, if impacted.

Vermiculite

NYSDOH requires additional second tier analysis of spray-on fireproofing and other surfacing materials found to contain 1% or greater vermiculite during standard PLM bulk sample analysis. The purpose of the NYS ELAP 198.8 method is to reduce background interference in order to verify asbestos content down to 1%.

Representative Nature of All Sampling:

The purpose of bulk sampling is to characterize representative materials, not remove and test every square inch of material. The Inspector/Investigator uses a combination of EPA recommended bulk sampling criteria and professional judgment to select representative sampling locations of each suspect material type. In certain rare cases, building materials may appear to be homogeneous (e.g. plaster, roofing, etc.) but vary section to section due to patching, different installation methods floor-to-floor, and other causes. Additional testing beyond normal survey protocol can be required for these scenarios.

Asbestos Survey Methodology:

HOMOGENEOUS AREAS: A homogeneous area is a portion of a building/structure with similar/same installed materials such that bulk analysis results from one area can be applied in the next for the purpose of asbestos quantification.

'FIRST POSITIVE STOP': In order to reduce unnecessary survey laboratory analysis costs when samples are collected in groups of three (3) or two (2), as required by EPA sampling criteria, when the first or second sample is reported as positive in a group, then the additional samples are declared positive with no analysis.

SAMPLING FROM SLAB UP: Because older/original bottom layer materials are more likely to contain asbestos versus newer layers, materials such as floor tiles and roofing are sampled from the slab up. If a positive lower or middle layer is identified, all materials in the layered system can be declared ACM if they cannot be separated during the abatement process.

SHEETROCK JOINT COMPOUND TESTING: Since most sheetrock wallboard systems are painted, it is difficult to impossible to assess where one type of material starts and ends. EPA has published memos concerning composite sampling that were not approved by OSHA which requires discrete sampling. This agency does not recognize composite testing of joint compound for the purpose of preventing employee exposure. NYSDOL also requires separate sampling of joint compound. The PLM analysis method has been generally utilized for this material type, where samples in the trace-1% inconclusive range are also run by TEM-NOB for additional accuracy.

Asbestos Bulk Sampling & Analysis Results:

Representative bulk sampling and analysis was conducted on 1/22 & 2/24/2022 by Eddy Montoya, Gboyega Adewuyi and Anton Rezin according to the following:

SAMPLE HA		HA SAMPLE LOCATION		EST. #	FRIABLE/ NON- FRIABLE	LAB RESULTS	
ID	па	SAMPLE LOCATION	MATERIAL DESCRIPTION	OF LAYERS		%Asbestos	%Vermiculite
1	1	3 rd Floor – Class 352	Spray On Fire Proofing - Fluffy	1	Friable	None Detected	None Detected
2	1	3 rd Floor – Class 351	Spray On Fire Proofing – Fluffy	1	Friable	None Detected	None Detected
3	1	2 nd Floor – Class 250	Spray On Fire Proofing – Fluffy	1	Friable	None Detected	None Detected
4	1	2 nd Floor – Corridor	Spray On Fire Proofing – Fluffy	1	Friable	None Detected	None Detected
5	1	1 st Floor – Class 151	Spray On Fire Proofing – Fluffy	1	Friable	None Detected	None Detected
6	2	3 rd Floor – Corridor	Ceiling Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
7	2	3 rd Floor – Corridor	Ceiling Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
8	2	3 rd Floor – Corridor	Ceiling Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
9	2	2 nd Floor – Corridor	Ceiling Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
10	2	2 nd Floor – Corridor	Ceiling Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
11	2	1 st Floor – Corridor	Ceiling Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
12	2	1 st Floor – Corridor	Ceiling Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
13	3	3 rd Floor – Corridor	Ceiling Plaster White Coat	1 of 2	Friable	None Detected	None Detected
14	3	3 rd Floor – Corridor	Ceiling Plaster White Coat	1 of 2	Friable	None Detected	None Detected
15	3	3 rd Floor – Corridor	Ceiling Plaster White Coat	1 of 2	Friable	None Detected	None Detected
16	3	2 nd Floor – Corridor	Ceiling Plaster White Coat	1 of 2	Friable	None Detected	None Detected
17	3	2 nd Floor – Corridor	Ceiling Plaster White Coat	1 of 2	Friable	None Detected	None Detected
18	3	1 st Floor – Corridor	Ceiling Plaster White Coat	1 of 2	Friable	None Detected	None Detected
19	3	1 st Floor – Corridor	Ceiling Plaster White Coat	1 of 2	Friable	None Detected	None Detected
20	4	3 rd Floor – Corridor	Wall Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
21	4	3 rd Floor - Corridor	Wall Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
22	4	3 rd Floor – Corridor	Wall Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected

Page 4: Asbestos bulk sampling report Ω Omega Environmental Services, Inc. 280 Huyler Street \bullet So. Hackensack, NJ 07606 \bullet Tel: (201) 489-8700 \bullet Fax: (201) 342-5412

SAMPLE				EST. #	FRIABLE/	LAB RESULTS	
ID	HA	SAMPLE LOCATION	MATERIAL DESCRIPTION	OF LAYERS	NON- FRIABLE	%Asbestos	%Vermiculite
23	4	2 nd Floor – Library	Wall Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
24	4	2 nd Floor – Corridor	Wall Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
25	4	1 st Floor – Corridor	Wall Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
26	4	1 st Floor – Corridor	Wall Plaster Brown Coat	2 of 2	Friable	None Detected	None Detected
27	5	3 rd Floor – Corridor	Wall Plaster White Coat	1 of 2	Friable	None Detected	None Detected
28	5	3 rd Floor – Corridor	Wall Plaster White Coat	1 of 2	Friable	None Detected	None Detected
29	5	3 rd Floor – Corridor	Wall Plaster White Coat	1 of 2	Friable	None Detected	None Detected
30	5	2 nd Floor – Library	Wall Plaster White Coat	1 of 2	Friable	None Detected	None Detected
31	5	2 nd Floor – Corridor	Wall Plaster White Coat	1 of 2	Friable	None Detected	None Detected
32	5	1 st Floor – Corridor	Wall Plaster White Coat	1 of 2	Friable	None Detected	None Detected
33	5	1 st Floor – Corridor	Wall Plaster White Coat	1 of 2	Friable	None Detected	None Detected
34	6	2 nd Floor – Library	Drywall	1	Friable	None Detected	None Detected
35	6	1 st Floor – Cafeteria	Drywall	1	Friable	None Detected	None Detected
36	7	2 nd Floor – Library	Joint Compouns	1	Friable	None Detected	None Detected
37	7	2 nd Floor – Library	Joint Compound	1	Friable	None Detected	None Detected
38	7	1 st Floor – Cafeteria	Joint Compound	1	Friable	None Detected	None Detected
39	7	1 st Floor – Cafeteria	Joint Compound	1	Friable	None Detected	None Detected
40	7	3 rd Floor – Classroom – Soffit	Joint Compound	1	Friable	None Detected	None Detected
41	7	3 rd Floor – Classroom – Soffit	Joint Compound	1	Friable	None Detected	None Detected
42	7	2 nd Floor – Classroom – Soffit	Joint Compound	1	Friable	None Detected	None Detected
43	8	3 rd Floor – MER 317A	Terracotta	1	Friable	None Detected	None Detected
44	8	1 st Floor – Corridor	Terracotta	1	Friable	None Detected	None Detected
45	9	3 rd Floor – MER 317A	Terracotta - Mortar	1	Friable	None Detected	None Detected
46	9	3 rd Floor – MER 313	Terracotta – Mortar	1	Friable	None Detected	None Detected
47	9	2 nd Floor – Corridor	Terracotta – Mortar	1	Friable	None Detected	None Detected

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SAMPLE ID		SAMPLE LOCATION	MATERIAL DESCRIPTION	EST. #	FRIABLE/	LAB RESULTS	
	HA			OF LAYERS	NON- FRIABLE	%Asbestos	%Vermiculite
48	9	2 nd Floor – Corridor	Terracotta – Mortar	1	Friable	None Detected	None Detected
49	9	1 st Floor – Corridor	Terracotta – Mortar	1	Friable	None Detected	None Detected
50	10	3 rd Floor – MER 317A	Red Brick	1	Friable	None Detected	None Detected
51	10	1 st Floor – Corridor	Red Brick	1	Friable	None Detected	None Detected
52	11	3 rd Floor – MER 317A	Red Brick - Mortar	1	Friable	None Detected	None Detected
53	11	3 rd Floor – MER 313	Red Brick - Mortar	1	Friable	None Detected	None Detected
54	11	2 nd Floor – Corridor	Red Brick - Mortar	1	Friable	None Detected	None Detected
55	11	2 nd Floor – Corridor	Red Brick - Mortar	1	Friable	None Detected	None Detected
56	11	1 st Floor – Corridor	Red Brick - Mortar	1	Friable	None Detected	None Detected
57	12	2 nd Floor – Library	CMU	1	Friable	None Detected	None Detected
58	12	3 rd Floor – MER 313	CMU	1	Friable	None Detected	None Detected
59	13	2 nd Floor – Library	CMU – Mortar	1	Friable	None Detected	None Detected
60	13	3 rd Floor – MER 313	CMU – Mortar	1	Friable	None Detected	None Detected
61	13	1 st Floor – Staircase	CMU – Mortar	1	Friable	None Detected	None Detected
62	13	1 st Floor – Staircase	CMU – Mortar	1	Friable	None Detected	None Detected
63	13	2 nd Floor – Corridor	CMU – Mortar	1	Friable	None Detected	None Detected
64	14	3 rd Floor – Cut Zone	Terrazzo Flooring	1	Friable	None Detected	None Detected
65	14	2 nd Floor – Cut Zone	Terrazzo Flooring	1	Friable	None Detected	None Detected
66	15	3 rd Floro – Corridor	Glue Dollups – Brown	1	Non-Friable	None Detected	None Detected
67	15	1 st Floor – Cafeteria	Glue Dollups – Brown	1	Non-Friable	None Detected	None Detected
68	16	3 rd Floor – Corridor	Fiberglass Pipe Wrap	1	Friable	None Detected	None Detected
69	16	2 nd Floor – Corridor	Fiberglass Pipe Wrap	1	Friable	None Detected	None Detected
70	16	1 st Floor – Corridor	Fiberglass Pipe Wrap	1	Friable	None Detected	None Detected
71	17	2 nd Floor – Library	2x4 Design Ceiling Tile	1	Non-Friable	None Detected	None Detected
72	17	2 nd Floor – Library	2x4 Design Ceiling Tile	1	Non-Friable	None Detected	None Detected

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SAMPLE ID	НА	SAMPLE LOCATION	MATERIAL DESCRIPTION	EST. #	FRIABLE/	LAB RESULTS	
				OF LAYERS	NON- FRIABLE	%Asbestos	%Vermiculite
73	18	3 rd Floor – Corridor	2x2 Ceiling Tile – Fiberglass Wrap	1	Non-Friable	None Detected	None Detected
74	18	2 nd Floor – Corridor	2x2 Ceiling Tile – Fiberglass Wrap	1	Non-Friable	None Detected	None Detected
75	19	3 rd Floor – Corridor	Fiberglass Duct Wrap	1	Friable	None Detected	None Detected
76	19	2 nd Floor – Corridor	Fiberglass Duct Wrap	1	Friable	None Detected	None Detected
77	19	1 st Floor – Corridor	Fiberglass Duct Wrap	1	Friable	None Detected	None Detected
78	20	1 st Floor – Cafeteria	2x1 Ceiling Tile	1	Non-Friable	None Detected	None Detected
79	20	1 st Floor – Cafeteria	2x1 Ceiling Tile	1	Non-Friable	None Detected	None Detected
80	21	1 st Floor – Cafeteria	1x1 Ceiling Tile	1	Non-Friable	None Detected	None Detected
81	21	1 st Floor – Cafeteria	1x1 Ceiling Tile	1	Non-Friable	None Detected	None Detected
82	22	2 nd Floor – Library	2x4 Fischer Ceiling Tile	1	Non-Friable	None Detected	None Detected
83	22	2 nd Floor – Library	2x4 Fischer Ceiling TIle	1	Non-Friable	None Detected	None Detected
84	23	3 rd Floor – Room 352	2x2 Ceiling Tile - Pinholes	1	Non-Friable	None Detected	None Detected
85	23	3 rd Floor – Room 352	2x2 Ceiling Tile – Pinholes	1	Non-Friable	None Detected	None Detected
86	24	3 rd Floor – Weight Room – MER	Pink Fire Stop Caulk	1	Non-Friable	Trace Chrysotile	None Detected
87	24	3 rd Floor – Weight Room – MER	Pink Fire Stop Caulk	1	Non-Friable	None Detected	None Detected
88	25	2 nd Floor – Library	Blue Cove Base Glue	2 of 2	Non-Friable	None Detected	None Detected
89	26	2 nd Floor – Library	Blue Cove Base	1 of 2	Non-Friable	None Detected	None Detected
90	25	2 nd Floor – Library	Blue Cove Base Glue	2 of 2	Non-Friable	None Detected	None Detected
91	26	2 nd Floor – Library	Blue Cove Base	1 of 2	Non-Friable	None Detected	None Detected
92	27	3 rd Floor – Corridor	Red Fire Stop Caulk	1	Non-Friable	None Detected	None Detected
93	27	2 nd Floor – Corridor	Red Fire Stop Caulk	1	Non-Friable	None Detected	None Detected
94	28	3 rd Floor – Corridor	Beige Duct Caulk	1	Non-Friable	None Detected	None Detected
95	28	2 nd Floor – Corridor	Beige Duct Caulk	1	Non-Friable	None Detected	None Detected
96	29	3 rd Floor – MER 313	Gray Duct Caulk	1	Non-Friable	None Detected	None Detected
97	29	3 rd Floor – MER 313	Gray Duct Caulk	1	Non-Friable	None Detected	None Detected

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SAMPLE ID	НА	SAMPLE LOCATION	MATERIAL DESCRIPTION	EST. #	FRIABLE/	LAB RESULTS	
				OF LAYERS	NON- FRIABLE	%Asbestos	%Vermiculite
98	30	3 rd Floor – Corridor	Expanison Caulk	1	Non-Friable	None Detected	None Detected
99	30	2 nd Floor – Corridor	Expansion Caulk	1	Non-Friable	None Detected	None Detected
100	31	3 rd Floor – Room 352	Mastic Under 12x12 Tan Tile	2 of 2	Non-Friable	None Detected	None Detected
101	32	3 rd Floor – Room 352	12x12 Tan Tile with Blue Specks	1 of 2	Non-Friable	None Detected	None Detected
102	31	2 nd Floor – Room 206	Mastic Under 12x12 Tan Tile	2 of 2	Non-Friable	None Detected	None Detected
103	32	2 nd Floor – Room 206	12x12 Tan Tile with Blue Specks	1 of 2	Non-Friable	None Detected	None Detected
104	33	3 rd Floor – Room 313	Mastic Under 12x12 White Tile	2 of 2	Non-Friable	None Detected	None Detected
105	34	3 rd Floor – Room 313	12x12 White Tile	1 of 2	Non-Friable	None Detected	None Detected
106	33	1 st Floor – Principal Office	Mastic Under 12x12 White Tile	2 of 2	Non-Friable	None Detected	None Detected
107	34	1 st Floor – Principal Office	12X12 White Tile	1 of 2	Non-Friable	None Detected	None Detected
108	35	2 nd Floor – Library	Leveling Compound	3 of 3	Friable	None Detected	None Detected
109	35	2 nd Floor – Library	Leveling Compound	3 of 3	Friable	None Detected	None Detected
110	36	2 nd Floor – Library	Glue Under Carpet	2 of 3	Non-Friable	None Detected	None Detected
111	36	2 nd Floor – Library	Glue Under Carpet	2 of 3	Non-Friable	None Detected	None Detected
112	37	Façade – Exterior	Decorative Stone	1	Friable	None Detected	None Detected
113	37	Façade – Exterior	Decoartive Stone	1	Friable	None Detected	None Detected
114	38	Façade – Exterior	Decorative Stone – Mortar	1	Friable	None Detected	None Detected
115	38	Façade – Exterior	Decorative Stone – Mortar	1	Friable	None Detected	None Detected
116	38	Façade – Exterior	Decorative Stone – Mortar	1	Friable	None Detected	None Detected
	<u> </u>		2/24/2022	1	1		
1	1	Gym	Black Mastic	-	Non-Friable	5.55% Chrysotile	None Detected
2	1	Gym	Black Mastic	-	Non-Friable	Positive Stop	-
3	2	Gym	Glue	-	Non-Friable	None Detected	None Detected
4	2	Gym	Glue	-	Non-Friable	None Detected	None Detected

Survey Field Notes:

The following was noted during the survey process:

• Inspection was limited and partial to specific SOW detailed on drawings.

Exclusions/exemptions/assumptions

The following areas/materials were found to be inaccessible:

► N/A

These materials were not reflected in the total estimated quantity of ACM listed below.

Next Step in Asbestos Survey Process:

POSITIVE MATERIAL(S) DELINEATED

The following positive ACM was delineated:

TABLE 3: POSITIVE MATERIAL SUMMARY						
LOCATION	MATERIAL DESCRIPTION	ASSESSED CONDITION	ESTIMATED QUANTITY* (square/linear feet)			
Gym	Black Mastic	Good	Throughout			
*Since many asbesto		ning areas and/or layers, fina	estimated quantities of abatement			

Since the subject delineated ACM is going to be removed or otherwise disturbed, an "Asbestos Abatement Work Plan" should be developed so that an abatement Contractor can be retained to perform the work. ACM must be removed prior to the onset of general trade work and can impact overall project schedule.

Material condition classification "significantly damaged" would trigger immediate clean-up of damaged ACM.

If risers/chases/walls/ceilings opened for mechanical tie-in work, then additional asbestos investigation will be required.

If you or your associates have any questions regarding this report, please contact office @ 201.489.8700.

Attachments:

- Copies of survey personnel and company asbestos license
- Survey photo-documentation
- Laboratory analysis reports with chain-of-custody

New York State - Department of Labor

Division of Selety and Health License and Certificate Unit State Campus, Building 12 Albany, NY 12240

ASBESTOS HANDLING LICENSE

Omega Laboratories, Inc.

280 Huyler Street

S. Hackensack, NJ 07606

FILE NUMBER: 99-0200 LICENSE NUMBER: 29673 LICENSE CLASS: RESTRICTED DATE OF ISSUE: 03/04/2022 EXPIRATION DATE: 03/31/2023

Duly Authorized Representative - Gary Mellor:

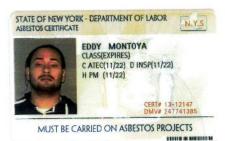
M

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

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

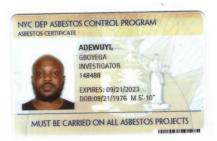
SH 432 (8/12)

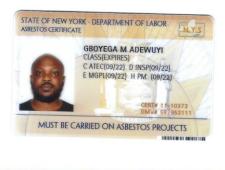
Anny Phillips, Director For the Commissioner of Labor

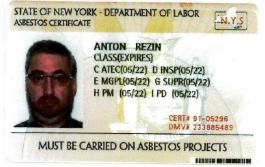




MUST BE CARRIED ON ALL ASBESTOS PROJECTS











1x1 Ceiling Tile



2x1 Ceiling Tile

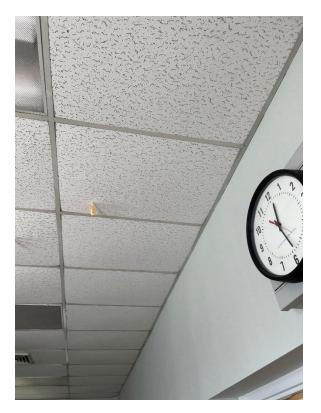
Page 13: Asbestos bulk sampling report Ω Omega Environmental Services, Inc. 280 Huyler Street \bullet So. Hackensack, NJ 07606 \bullet Tel: (201) 489-8700 \bullet Fax: (201) 342-5412



2x2 Fiberglass Ceiling Tile Wrap



2x2 Pinhole Ceiling Tile



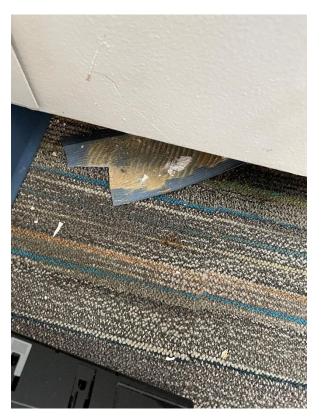
2x4 Fissured Ceiling Tile



12x12 Tan Tile With Mastic



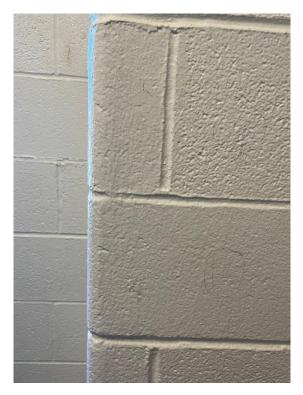
12x12 White Tile and Mastic



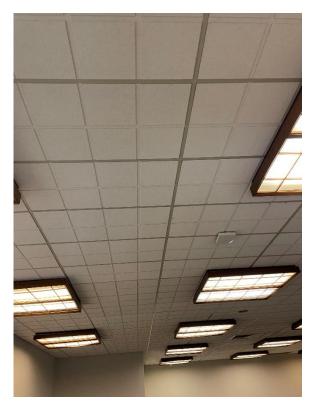
Blue Cove Base and Glue



Brick and Mortar



CMU Mortar



Decorative 2x4 Ceiling Tile



Decorative Stone and Mortar



Drywall



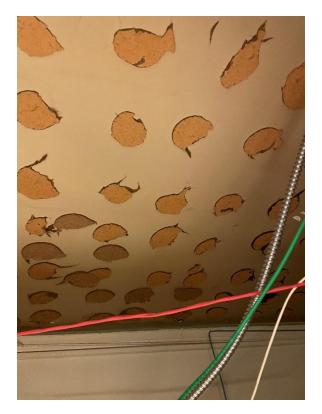
Duct Fiberglass Wrap Page 19: Asbestos bulk sampling report Ω Omega Environmental Services, Inc. 280 Huyler Street • So. Hackensack, NJ 07606 • Tel: (201) 489-8700 • Fax: (201) 342-5412



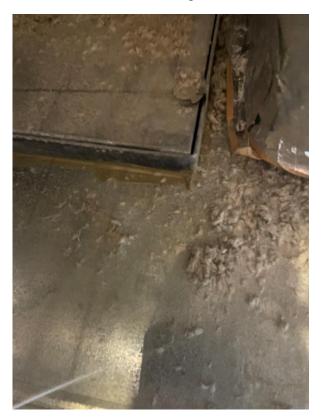
Expanison Caulk



Fiberglass Pipe Wrap



Glue Dollups



Gold Duct Insulation

 $Page \ 21: \ As best os \ bulk \ sampling \ report$ \$\Omega Environmental Services, Inc. 280 Huyler Street \$\u03c4 So. Hackensack, NJ 07606 \$\u03c4 Tel: (201) 489-8700 \$\u03c4 Fax: (201) 342-5412\$}



Gray Duct Caulk



Joint Compound



No Door Insulation



Partition Build Up Page 23: Asbestos bulk sampling report Ω Omega Environmental Services, Inc. 280 Huyler Street • So. Hackensack, NJ 07606 • Tel: (201) 489-8700 • Fax: (201) 342-5412



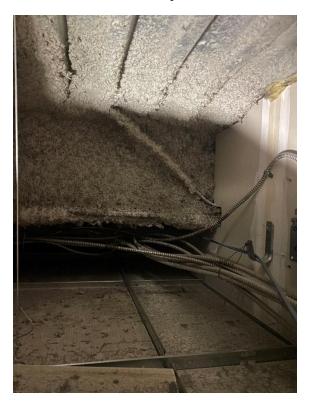
Pink Fire Stop Caulk



Plaster Ceiling



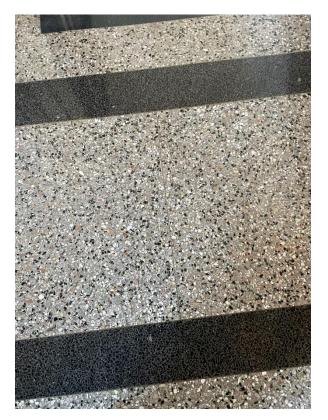
Red Fire Stop Caulk



SOFP – Fluffy



Terracotta and Mortar



Terrazzo Flooring

 $Page \ 26: \ As best os \ bulk \ sampling \ report$ $\Omega \ Omega \ Environmental \ Services, \ Inc. \ 280 \ Huyler \ Street \ \bullet \ So. \ Hackensack, \ NJ \ 07606 \ \bullet \ Tel: \ (201) \ 489-8700 \ \bullet \ Fax: \ (201) \ 342-5412$

Client/Add1	ress: Omega	Env	ironmental/.	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606	Γ	Project: 65 Siwanoy Blvd	lvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043	<u>4</u> 3		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	5/22, 01/27/22	2		
Client ID # Lab ID #		00\$0.	Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII % PLI	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
-	A GR	<u>ய</u>	3 60			NAD				
-	B 1	ц Ц	6	ly on Fire	40.00	NVD				NAD
22-01-043-	C 198.1	U	0	Proofing- Fluffy	20.01	4				
01	D	Н	1							
ſ	A GR	Е	3 60			NAD		<u> </u>		
1	B	ц	(*	iy on Fire	10.00	DVD				UVN
22-01-043-	C 198.1	U	(7)		40.00					U EN
02	Q	H	I							
7	A GR	ш	3 60			NAP				
n	B 1	내	r.	2nd Floor, Class 250, Spray on Fire		QVN 2				UVN
22-01-043-	C 198.1	G	1	Proofing-Fluffy						
03	D	H	I	, , , , , , , , , , , , , , , , , , ,	à					
V	A GR	ш	3 60	S O C		NAD				
ŀ	B 1	<u>ш</u>		2nd Floor, Corridor, Spray on Fire	40.00	NVD				NAD
22-01-043-	C 198.1	Ð		Proofing-Fluffy	00.01					
04	D	Н	1							
s.	A GR	ш	3 60			NAD				
	B 1	[T]		iy on Fire	00 UV	NVD				NAD
22-01-043-	C 198.1	Ð		Proofing- Fluffy	20.01	and the second se				
05	D	Ш.								
y	A BR	11 100				NAD				
>	B 1	[L,		ling Plaster	100.00	NVD				NAD
22-01-043-	C 198.1	G		Brown Coat	0000					
06	D	H	1							

BULK ASBESTOS TEST REPORT

Client/Address: Omega Environmental/280 Huyler St.,	80 Huyler St., So. Hackensack, NJ 07606		Project: 65 Siwanoy Blvd	y Blvd	Pro	Proj#: 22-1037	
Laboratory ID: 22-01-043	Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
BR E			NAD				
1 F	3rd Floor, Corridor, Ceiling Plaster	100.00	NVD				NAD
198.1 G	Brown Coat	0.001					
Н							
BR E			DAD GAN		42		
1	3rd Floor, Corridor, Ceiling Plaster	100.00	QUN		N N		UVN
198.1 G	Brown Coat	100.001		7) Natural Natural		NAU
H				N.			
BR E			NAD V				
1 F	2nd Floor, Corridor, Ceiling Plaster	100.00	Q'WD				UVN
198.1 G	Brown Coat	100.00					TEN
H		l l					
BR E	2000		NAD				
1 F	2nd Floor, Corridor, Ceiling Plaster	100.00	NVD				U V D
198.1 G	Brown Coat	00.001					
H							
BR E			NAD				
1 F	1st Floor, Corridor, Ceiling Plaster	100.001	NVD				U V N
198.1 G	Brown Coat	INGYNO					ach
Ĥ							
BRE			NAD				
1 F	1st Floor, Corridor, Ceiling Plaster	100.00	NVD				U A D
198.1 G	Brown Coat	100.001					
Η							

BULK ASBESTOS TEST REPORT

Page 2 of 21

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01 Phon
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Ave. LIC
12 38th /
INC. 29-12
WICES
ING SEF
Y TESTI
LABORATORY TESTING SERVICES INC. 29-12 38th
LAE

		3 70TAL Asbestos	NAD	NAD	NAD	NAD	NAD	NAD
Proj#: 22-1037		% *TEM NOB Results						
Pro	01/27/22	% PLM NOB Results						
oy Blvd	01/25/22, (W All	<u> </u>	0				
Project: 65 Siwanoy Blvd	Date of Analysis: 01/25/22, 01/27/22	% Friable Results	NAD NVD	NAD UVN	DVD DVD	NAD NVD	NAD NVD	NAD NVD
		% Non- Fibrous Material	100.00	100.00	100:00	100.00	100.00	100.00
280 Huyler St., So. Hackensack, NJ 07606		Sample Description	3rd Floor, Corridor, Ceiling Plaster White Coat	3rd Floor, Corridor, Ceiling Plaster White Coat	3rd Floor, Corridor, Ceiling Plaster White Coat	2nd Floor, Corridor, Ceiling Plaster White Coat	2nd Floor, Corridor, Ceiling Plaster White Coat	1st Floor, Corridor, Ceiling Plaster White Coat
Client/Address: Omega Environmental/280 Huyler St.,	Laboratory ID: 22-01-043	Stereomicroscope Analysis	A WH E B B 1 F C D D D D D D D D D D D D D D D D D D	A WH E B 1 F C 198.1 G D H	A WH E B 1 F C 198.1 G D H	A WH E B 1 F C 198.1 G D H	A WH E B 1 F C 198.1 G D H	A WH E B 1 F C 198.1 G
Client/Addre	Laboratory	Client ID # Lab ID #	13 22-01-043- 13	14 22-01-043- 14	15 22-01-043- 15	16 22-01-043- 16	17 22-01-043- 17	18 22-01-043-

BULK ASBESTOS TEST REPORT

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Client/Addr	ess: Omega E	Inviro	onmental/2	Client/Address: Omega Environmental/280 Huvler St., So. Hackensack, NJ 07606		Project: 65 Siwanoy Blvd	y Blvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043	3		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22)1/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	scope	Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
0	H WH	E				NAD				
ст Т	B 1 C 108 1	цĊ		1st Floor, Corridor, Ceiling Plaster White Coat	100.00	NVD				NAD
22-01-043- 19										
	A BR	Ξ				NAD				
8	B 1	Ľ.		3rd Floor, Corridor, Wall Plaster	100.001	NVD	92			NAD
22-01-043-	C 198.1	υ		Brown Coat	Toron		5			
20	0	E								
;	A BR	Э				NAD (
7	B 1	Ŀ		3rd Floor, Corridor, Wall Plaster	100.00	AVD 2				NAD
22-01-043-	C 198.1	0		Brown Coat	100.00					
21	D	H			i.					
ć	A BR	Ш				NAD				
77	B 1	Ľ.		3rd Floor, Corridor, Wall Plaster	00 001	DVD				
22-01-043-	C 198.1	U	in Sin	Brown Coat	00.001					
22	D	H	<u> </u>							
ç	A BR	E	in the second			NAD				
C 7	B 1	Ľ		all Plaster Brown	100.00	DVD				NAD
22-01-043-	C 198.1	ତ୍ତ		Coat	20-201					
23	D	ي ب ب								
ř.	A BR	ш				NAD				
t 1	B 1	F		2nd Floor, Corridor, Wall Plaster	100.00	NVD				
22-01-043-	C 198.1	Ð		Brown Coat						
24	D	Н								

BULK ASBESTOS TEST REPORT

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Laboratory: ID: 22-01-043Date of Report: 02/03/22Date of Analysis: 01/25/22, 01/25/22, 01/25/22, 01/22/22Cleart ID # Lab ID #Sereomicroscope A analysisSample Description% Non- NAD% Friable Results% AII% PLM NOB% -FIE Results23 \boxed{B} \boxed{F} $\boxed{1}$ \boxed{F} $\boxed{1}$ \boxed{F} $\boxed{1}$ \boxed{K} \boxed{K} % Friable Results% AII% Results25 \boxed{B} $\boxed{1}$ \boxed{F} $\boxed{1}$ \boxed{K} \boxed{K} \boxed{K} \boxed{K} \boxed{K} % Friable Results% AII% Friable Friable Results% AII% Friable Frieber Frieber Withe% AII% AII% AII% AII% AII22-01-043 \boxed{C} $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ % AII%% AII%%%22-01-043 $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ %%%%%%%22-01-043 $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ $\boxed{1}$ <t< th=""><th>Client/Addr</th><th>ess: Omega I</th><th>Env</th><th>ironmental/2</th><th>Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606</th><th>Γ</th><th>Project: 65 Siwanoy Blvd</th><th>by Blvd</th><th>Pro</th><th>Proj#: 22-1037</th><th></th></t<>	Client/Addr	ess: Omega I	Env	ironmental/2	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606	Γ	Project: 65 Siwanoy Blvd	by Blvd	Pro	Proj #: 22-1037	
Stereomicroscope Analysis Sample Description % Non- Fibrous % Nal- Material % All % PLM NOB Results A BR E Ist Floor, Corridor, Wall Plaster Brown 100.00 MND Results % All A BR E Ist Floor, Corridor, Wall Plaster Brown 100.00 MND MOD A BR E Ist Floor, Corridor, Wall Plaster Brown 100.00 NND P P A BR E Ist Floor, Corridor, Wall Plaster Mare NND NND P P A WH E NND NND NND P	Laboratory	ID: 22-01-0 ²	<u>4</u> 3		Date of Report: 02/03/22		Date of Analysis:	01/25/22,	,01/27/22		
	Client ID # Lab ID #	Stereomicro	osco	pe Analysis	Sample Description		% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
BIFIst Floor, Corridor, Wall Plaster Brown100.00WUDNUDC198.1CMADNVDNVDNVDABRFNVDNVDNVDNVDBIFNVDNVDNVDNVDC198.1CNVDNVDNVDNVDC198.1FNADNVDNVDNADC198.1GNVDNADNVDNADAWHENADNVDNADNDDHNCoatCoatNADNDC198.1GNADNDNDNDDHFNADNDNDNDAWHENADNDNDNDAWHENDNDNDNDBIFNDNDNDNDAWHENDNDNDNDAWHENDNDNDNDBIFNDNDNDNDBINHENDNDNDAWHENDNDNDNDAWHENDNDNDNDBIFNDNDNDNDAWHENDNDNDNDBIFNDNDNDND <trr>CI<</trr>	зс						NAD				
	C7	B 1	<u> </u>	Гт.	1st Floor, Corridor, Wall Plaster Brown		NVD				NAD
	22-01-043-		\vdash		Coat	00.001					
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	25	D	<u> </u>	I							
	уr У			[1]			NAD		- Aliter		
C198.1GCoatNAD D HHNADNAD A WHE MAD NAD B IF MAD NAD B IF MAD NAD C 198.1G NAD NAD C 198.1G NAD NAD A WHE NAD NAD A HE NAD NAD A HE NAD ND A H	01	B 1		ſx.	1st Floor, Corridor, Wall Plaster Brown	100.00	NVD		407.		NAD
DHHNADAWHENADNADBIFNVDNVDC198.1GNVDNVDC198.1GNVDNVDAWHENVDNVDAWHENVDNVDC198.1GNVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDBIFOcoatNVDBIFNVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDAWHENVDNVDBIFCoatNVDBIFNVDNVDBIFNVDNVDBIFNVDNVDBIFNVDNVDC198.1GNVDNVDDIHINVDDIIFNVDDIIIIDIIIID </td <td>22-01-043-</td> <td>U U</td> <td>Ĕ</td> <td>0</td> <td>Coat</td> <td></td> <td></td> <td>C</td> <td></td> <td></td> <td></td>	22-01-043-	U U	Ĕ	0	Coat			C			
AWHEB1F3rd Floor, Corridor, Wall Plaster WhiteC198.1GC198.1GAWHEAWHEC198.1GC198.1GDHEAWHEAWHEAWHEB1FAWHEAWHEAWHEAWHEAWHEB1FAWHEAWHEB1FC198.1GC198.1GDH2nd Floor, Library, Wall Plaster White100:00CoatC198.1G	26	Q		I				S I			
	r,		 				NAD V				
	/7	B 1	I	(T **	15/25/2	100.001	NVD				NAD
DHHAWHEB1FC198.1GC198.1GDWHEAWHEAWHED1FAWHEAWHEAWHEAWHEAWHEAWHEAWHEAWHEAWHEAWHEAWHEAWHEAWHEB1FC198.1GC198.1GC198.1GDHCoatDHCoat	22-01-043-		P	5							
AWHEB1F3rd Floor, Corridor, Wall Plaster White100.00C198.1GCoat100.00AWHE3rd Floor, Corridor, Wall Plaster White100.90B1F3rd Floor, Corridor, Wall Plaster White100.90C198.1GCoat100.90AWHE2rd Floor, Library, Wall Plaster White100.90AWHECoat100.90B1F2nd Floor, Library, Wall Plaster White100.00B1FCoatCoatB1FCoatCoatDHCoatCoatDHFCoat	27	D	<u> </u>	H		i).					
	36			[1]			NAD				
	04	B 1	-	(T	3rd Floor, Corridor, Wall Plaster White	100.00	NVD				NAD
DHHHAWHE100:00B1F3rd Floor, Corridor, Wall Plaster White100:00C198.1GCoatAWHECoatAWHE2nd Floor, Library, Wall Plaster White100:00B1F2nd Floor, Library, Wall Plaster White100:00C198.1GCoat100:00DHF2nd Floor, Library, Wall Plaster White100:00	22-01-043-		\leq		Coat	00001					
AWHEB1F3rd Floor, Corridor, Wall Plaster White100:00C198.1GCoat100:00DHE2nd Floor, Library, Wall Plaster White100:00AWHE2nd Floor, Library, Wall Plaster White100:00B1F2nd Floor, Library, Wall Plaster White100:00C198.1GCoat100:00	28	D	<u> </u>	H							
B1F3rd Floor, Corridor, Wall Plaster White100.00C198.1GCoat100.00DWHECoat100.00AWHE2nd Floor, Library, Wall Plaster White100.00B1F2nd Floor, Library, Wall Plaster White100.00C198.1GCoat100.00DHHCoat100.00	6		⊢	m			NAD				
	67	B 1	<u> </u>	17	3rd Floor, Corridor, Wall Plaster White	100.001	NVD				NAD
D <u>H</u> <u>H</u> <u>H</u> AWH <u>E</u> B1 <u>F</u> C198.1GDHCoat	22-01-043-		5		Coat	22.001	· · · · · · · · · · · · · · · · · · ·				
AWHEB1FC198.1GDH	29	D	~ 山 山高級	F							
B1F2nd Floor, Library, Wall Plaster White100.00C198.1GCoat100.00DH	30		-Mahimi,	[7]			NAD				
C 198.1 G Coat D H	2	B 1	iliikaan.	[T	2nd Floor, Library, Wall Plaster White	100.00	NVD				NAD
D	22-01-043-		$\overline{}$	(7)	Coat						-
	30	D	-	I I							

BULK ASBESTOS TEST REPORT

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Client/Addr	ess: Omega E	Environmental	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606	90	Project: 65 Siwanoy Blvd		Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043	13	Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	5/22, 01/27/22		
Client ID # Lab ID #	Stereomicro	Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII % PLM NOB Results	k *TEM NOB Results	% TOTAL Asbestos
÷	A WH	Е			NAD			
51 2	B 1	F	2nd Floor, Corridor, Wall Plaster White	100.00	NVD			U A D
22-01-043-	C 198.1	G	Coat	100.001				aevi
31	D	H						
3	HM VH	Е			NAD			
4 7	B 1	ц	1st Floor, Corridor, Wall Plaster White	100.00	NVD			UAN
22-01-043-	C 198.1	G	Coat	100.001				
32	D	H						
	HM VI	E						
ĉ	B 1	F	1st Floor, Corridor, Wall Plaster White		MVD CVN			UAN
22-01-043-	C 198.1	6	Coat	100.000				
33	D	H	.255	2				
c	A BR/GR	E	200°		NAD			
 0 4	B 2	ĹĽ,	2nd Floor 1 ihom Dannell	75 00				UAN
22-01-043-	C 198.1	6	zila i tool, Liutaly, Diywali	00.01				
34	D 25	H						
35	A BR/GR	ш			NAD AN			
))	B 2	Ц	1st Eloor Cofstanio Deunioll	00.02				NAD
22-01-043-	C 198.1	9		20201				
35	D 30	Ĥ						
уг	A WH	E)			NAD			
0 1	B 1	F	2nd Floor 1 ibrary Joint Commonied	100.00				NAD
22-01-043-	C 198.1	G		00001				
36	D	H	1					

BULK ASBESTOS TEST REPORT

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Client/Addr	ress: Omega E	Environmental	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606	06	Project: 65 Siwanoy Blvd	y Blvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043	:3	Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicro	Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
37	A WH	ш			NAD				
<u>,</u>	B 1	ГТ	2nd Floor 1 ihrary Joint Commonind	100.001		·			U V N
22-01-043-	C 198.1	G		100.001					UEVI
37	D	Η							
ät	HM V	E			NAD		*		
2	B 1	íц.	1st Bloom Cofetenio Toint Commende	100.00		.			
22-01-043-	C 198.1	G	154 FIOU, Calefella, JUIIL Compound	100.00		1999 1999 (UAN
38	D	H				2			
20	HM V	E			NAD N				
	B 1	F		100.00		_			
22-01-043-	C 198.1	G	<u> </u>	100.00					UAN
39	D	H		is a					
40	HM H	E			NAD				
P	B 1	F	3rd Floor, Classroom- Soffit, Joint	100.00		•			CLAN
22-01-043-	C 198.1	G 🖉	Compound	100.001					UEN
40	D	H							
41	HM VH	E			NAD				
-	B 1	F	3rd Floor, Classroom- Soffit, Joint	00.001					U V N
22-01-043-	C 198.1	9	Compound	Inninn	Диень,				UAN
41	D	Ĥ				.			
ć	A WH	E			NAD				
7	B 1	F	2nd Floor, Classroom- Soffit, Joint	100.001					UVN
22-01-043-	C 198.1	G	Compound	00.001					
42	D	H							

BULK ASBESTOS TEST REPORT

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Client/Addr	ess: Omega E	Invironmental/	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606		Project: 65 Siwanoy Blvd	Blvd	Proj	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043	ņ	Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	/25/22, 01/27/	'22		
Client ID # Lab ID #	Stereomicro	Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results %	% AII % P]	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
43 22-01-043- 43	A R B 1 C 198.1 D	H C H	3rd Floor, MER 317A, Terracotta	100.00	DAD				DAD
4 4 22-01-043- 44	A R B 1 C 198.1 D	E F G	1st Floor, Corridor, Terracotta	100.00	den 1				NAD
45 22-01-043- 45	A BR B 1 C 198.1 D 1	H G F	3rd Floor, MER 317A, Terracotta- Mortar	100.00	NAP				NAD
46 22-01-043- 46	A BR B 1 C 198.1 D D	H H	3rd Floor, MER 313, Terracotta- Mortar	100.00	NAD				NAD
47 22-01-043- 47	A BR B 1 C 198.1 D	ш с о н	2nd Floor, Corridor, Terracotta- Mortar	100.00	NAD				NAD
48 22-01-043- 48	A BR B 1 C 198.1 D	E G H	- 2nd Floor, Corridor, Terracotta- Mortar	100.00	NAD				NAD

BULK ASBESTOS TEST REPORT

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Client/Address: Omega Environmental/280 Huyler St.,	nmental/	280 Huyler St., So. Hackensack, NJ 07606	06	Project: 65 Siwanoy Blvd	y Blvd		Proj#: 22-1037	
Laboratory ID: 22-01-043		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22)1/25/22,	01/27/22		
Stereomicroscope Analysis	Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
BR E				NAD				
		1st Floor, Corridor, Terracotta- Mortar	100.00					NAD
198.1 G								
R E				NAD				
1 F			100.00			10		
198.1 G		3rd Floor, MEK 31/A, Ked Brick	100.001					UAN
H					S S			
R E				NAD				
T F		1st Floor Corridor Dad Brick	100.00					
198.1 G			100.00					UAN
H		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	k					
GR E		2000		NAD				
1 F		3rd Floor, MER 317A, Red Brick-	100.00		•			
198.1 G		Mortar	00.001		•			GEN
H								
GR E				NAD				
1 F		3rd Floor, MER 313, Red Brick-	100.00					U V N
198.1 G		Mortar	100.00	Billion .	<u>.</u>			UAN
E								
GR E				NAD				
1 F		2nd Eloor Corridor Dad Drick Morton	100.00					U V N
198.1 G		zua 1001, comunol, teu Duer- Morta	00.001					N EN
Н								

BULK ASBESTOS TEST REPORT

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Client/Add	ess: Omega Er	ivironmental/	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606	06	Project: 65 Siwanoy Blvd	y Blvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	cope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% All	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
22	A GR	Е			NAD				
ר ז	B 1	Н	and Floor Corridor Red Brick- Monter	100.00					UVN
22-01-043-	C 198.1	G		100.001					
55	D	H							
9/5	A GR	E			NAD				
2	B 1	LL (Let Dione Comidon Ded Deda Monton	100.00		• <u> </u>			QYN
22-01-043-	C 198.1	G	15t rivol, Collidol, Red Blick- Mortal	100.001			and the second se		UAN
56	Ω	H				e V			
57	AGR	E			NAD				
Ċ.	BI	F		100.00					U V N
22-01-043-	C 198.1	9							aevi
57	D	H		5					
85	A GR	E			NAD				
2	B 1	F	3rd Bloor MEB 313 CMII	100.00					U V N
22-01-043-	C 198.1	G	DIAD CLC NTINI , IONI TRIC	100,001					
58	D	H							
59	A GR	Ш			NAD				
)	B 1	F	2nd Floor 1 ibrary CMIL Mortan	100.00					UVN
22-01-043-	C 198.1	Ð	zita i 1001, Liutary, CiviO- IviOliai	100,000					avu
59	D	ų							
60	A GR	Ш			NAD				
2	B 1	F	3rd Floor MER 313 CMI1- Mortar	100.00					NAD
22-01-043-	C 198.1	G		00.001					
60	D	Н							

BULK ASBESTOS TEST REPORT

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Client/Addre	Client/Address: Omega Environmental/280 Huyler St.,	ntal/280 Huyler St., So. Hackensack, NJ 07606		Project: 65 Siwanoy Blvd	y Blvd	Pro	Proj#: 22-1037	
Laboratory.	Laboratory ID: 22-01-043	Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22)1/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
61	GR 1	1st Floor, Staircase, CMU- Mortar	100.00	NAD				NAD
22-01-043- 61	C 198.1 G D H							
62	A GR E B 1 F			DAD 2				
22-01-043- 62	198.1	1st Floor, Staircase, CMU- Mortar	100.00		C Q	and the second sec		NAD
ç	GR			NAD				
	B 1 F C 108 1 G	2nd Floor, Corridor, CMU- Mortar	100.00		• • • • • •			NAD
22-01-043- 63	1.0/1	1.240	<i>~</i> ~					
64	GR	. 20c.		NAD				
	B 1 F	3rd Floor, Cut Zone, Terrazo Flooring	100.00					NAD
22-01-043- 64	H H							
65	A GR E			NAD				
)	1	2nd Floor, Cut Zone, Terrazo Flooring	100.00					NAD
22-01-043- 65	C 198.1 G							
, ve	A BR E					INC. NAD	NAD	
3	1	3rd Floor, Corridor, Glue Dollops-			42.86			DAD
22-01-043-	198.4/6	Brown						
66	D H							

BULK ASBESTOS TEST REPORT

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Client/Address: C	Client/Address: Omega Environmental/280 Huyler St.,	/280 Huyler St., So. Hackensack, NJ 07606		Project: 65 Siwanoy Blvd	y Blvd	Pro	Proj#: 22-1037	
Laboratory ID: 22-01-043	2-01-043	Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% All	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
67 A B 22-01-043- C 1 D 67	BR E 1 F 198.4/6 G H	1st Floor, Cafeteria, Glue Dollops- Brown			43.59	INC. NAD	NAD	NAD
68 A B 22-01-043- C 68 D	WH/S E 10 2 F 198.1 G 198.1 G 40 H	3rd Floor, Corridor, Fiberglass Pipe Wrap	\$0.00	UAD		0		NAD
69 B B 22-01-043- C C D	WH/S E 10 2 F 10 198.1 G 40	2nd Floor, Corridor, Fiberglass Pipe Wrap	50.00 C	NAD (1				NAD
70 A B 22-01-043- C C D	WH/S E 40 2 F / 198.1 G / 40 H	1st Floor, Corridor, Fiberglass Pipe Wrap	50.00	NAD				NAD
71 A B 22-01-043- C 1 D 71 D	GR E 1 F 198.4/6 G H	2nd Floor, Library, 2x4 Design Ceiling Tile			72.05	INC. NAD	NAD	NAD
72 A B 22-01-043- C 1 D	GR E 1 F 198.4/6 G H	2nd Floor, Library, 2x4 Design Ceiling Tile			68.29	INC. NAD	NAD	NAD

BULK ASBESTOS TEST REPORT

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Client/Addr	Client/Address: Omega Environmental/280 Huyler St.,	onmental/2	280 Huyler St., So. Hackensack, NJ 07606		Project: 65 Siwanoy Blvd	ioy Blvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	e Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
f	A Y/WH E						INC. NAD	NAD	
C/	B 2 F		3rd Floor, Corridor, 2x2 Ceiling Tile-	L		5934			NAD
22-01-043-	C 198.4/6 G		Fiberglass Wrap	Ń					
73	D H								
F	A Y/WH E						INC. NAD	NAD	
ţ	B 2 F		2nd Floor, Corridor, 2x2 Ceiling Tile-			78 74	40,7,		NAD
22-01-043-	C 198.4/6 G		Fiberglass Wrap						
74	H Q								
L C	A BR/S E	10			NAD V				
<u>ر</u>	B 2 F		3rd Floor, Corridor, Fiberglass Duct	50.05					NAD
22-01-043-	C 198.1 G		Wrap	-00.0C					
75	D 40 H			×					
76	A BR/S E	10	200°		NAD				
0/	B 2 F		2nd Floor, Corridor, Fiberglass Duct	50.00		1			NAD
22-01-043-	C 198.1 G	Balana,	Wrap	0000					
76	D 40 H								
	A BR/S E	10			NAD				
	B 2 F		1st Floor, Corridor, Fiberglass Duct	50.00					L NAD
22-01-043-	C 198.1 G		Wrap	22.22	Marken Str.				T
77	D 40 H								
78	A BR E						INC. NAD	NAD	·······
2	B 1 F		let Floor Cafeteria 2x1 Ceiling Tile			21.89			- NAD
22-01-043-	C 198.4/6 G								
78	D H								

BULK ASBESTOS TEST REPORT

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Client/Address: Omega Environmental/280 Huyler St., So. Hacker Laboratory ID: 22-01-043 Date of Report: 02/03/22
Sample Description
1st Floor Cafeteria 2x1 Ceiline Tile
1st Floor Cafeteria 1v1 Cailing Tile
134 / 1001, Calciula, 1A
1st Floor Cafeteria 1x1 Ceilino Tile
2nd Floor, Library, 2x4 Fischer Ceiling
Tile
2nd Floor, Library, 2x4 Fischer Ceiling
Tile
3rd Floor, Room 352, 2x2 Ceiling Tile-
Pinholes

BULK ASBESTOS TEST REPORT

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Client/Addr	Client/Address: Omega Environmental/280 Huyler St.,	ronmental/	280 Huyler St., So. Hackensack, NJ 07606		Project: 65 Siwanoy Blvd	ioy Blvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	e Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
85	A GR E						INC. NAD	NAD	
3	B 1 F		3rd Floor, Room 352, 2x2 Ceiling Tile-			82.02			NAD
22-02-043-	C 198.4/6 G		Pinholes	N.					1
85	D H								
98	A R E						INC. NAD	TRACE CH	
3	B 1 F		3rd Floor, Weight Room, MER, Pink			78.65	4.0~~		TRACE
22-02-043-	C 198.4/6 G		Fire Stop Caulk			0.07	and the second se		TWACE
86	H					* ^ ^			
87	ARE				S. N.X.		INC. NAD	NAD	
10	B I F		3rd Floor, Weight Room, MER, Pink	V V		28.38			UAN
22-02-043-	C 198.4/6 G		Fire Stop Caulk	y manya		00.07			
87	D H		226	\$					
88	A Y E						INC. NAD	NAD	
2	B 1 F		2nd Floor, Library, Blue Cove Base			26.15			UAN
22-02-043-	C 198.4/6 G		Glue						
88	H d								
80	A BL E						INC. NAD	NAD	
2	B 1 F		2nd Floor I ibrany Blue Cove Bees			CV L			NAD
22-02-043-	C 198.4/6 G				and the second	4 			
89	р П								
06	AY						INC. NAD	NAD	
~	B I F		2nd Floor, Library, Blue Cove Base			17.65			NAD
22-02-043-	C 198.4/6 G		Glue						
90	D H								

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vironmental/2	30 Huyler St., So. Hackensack, NJ 07606	506	Project: 65 Siwanoy Blvd	oy Blvd		Proj#: 22-1037	
Laboratory ID: 22-01-043	Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	,01/27/22		
Stereomicroscope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
BL E					INC. NAD	NAD	
1 F 108 1/6 G	2nd Floor, Library, Blue Cove Base	, ,		4.75			NAD
			<u>.</u>				
R E					INC. NAD	NAD	
1 F	3rd Floor, Corridor, Red Fire Stop			10 63	4.07		C V V
198.4/6 G	Caulk			6.4			UEV
H							
R E					INC. NAD	DAD	
1 F	2nd Floor, Corridor, Red Fire Stop	Y	and the second se	20.00			U Y N
198.4/6 G	Caulk	e C		10.02			TEN
H		h.					
Y E	200				INC. NAD	NAD	
1 F				16 20			
198.4/6 G	ord From, continuel, beige Duct Cauty			61.01			GEN
H							
Y E					INC. NAD	NAD	
1 F	and Eloor Comidor Baira Duot Coully			10 01			U V N
198.4/6 G	LINU LIVOI, CUILINUI, DEIBE DUCI CAUIN			+0.00			
Ĥ							
GR E					INC. NAD	NAD	
1 F	3rd Floor MFR 313 Grev Duct Caulk			10.78			NAD
198.4/6 G	ord root, when Jid, Ord, Duch Cauly			1001			
H							

BULK ASBESTOS TEST REPORT

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t: 02/03/22 t: 02/03/22 Date of Analysis: 01/25/22, 01/27/22 le Description % Non- Fibrous % Friable Results % All Results % FLM NOB % *TEM NOB R 313, Grey Duct Caulk Material % All % CAD NAD % R 313, Grey Duct Caulk Material % All % Friable Results % All % PLM NOB R 313, Grey Duct Caulk Material % All % CAD NAD % ridor, Expansion Caulk Material 1.37 % CAD NAD % ridor, Expansion Caulk Material 3.03 % CAD NAD % ridor, Expansion Caulk Material 3.03 % CAD NAD % midor, Expansion Caulk Material 3.03 % CAD NAD % midor, Expansion Caulk Material 3.03 % CAD NAD % midor, Expansion Caulk Material 3.03 % CAD NAD % midor, Expansion Caulk Material 3.03 % CAD NAD % midor, Expansion Caulk Material 3.03 % CAD NAD % midor, Expansion Caulk Material 3.03 % CAD <th>Client/Addr</th> <th>ess: Omega En</th> <th>vironmental/</th> <th>Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606</th> <th>90</th> <th>Project: 65 Siwanoy Blvd</th> <th>oy Blvd</th> <th>Pro</th> <th>Proj#: 22-1037</th> <th></th>	Client/Addr	ess: Omega En	vironmental/	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606	90	Project: 65 Siwanoy Blvd	oy Blvd	Pro	Proj#: 22-1037	
	Laboratory	ID: 22-01-043		Date of Report: 02/03/22		Date of Analysis:	01/25/22,	01/27/22		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Client ID # Lab ID #	Stereomicrosc	ope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	67		ш					INC. NAD	NAD	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	22-01-043-	1 198.4/6	G	3rd Floor, MER 313, Grey Duct Caulk			8.77			NAD
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	6		H							
	98		E					INC. NAD	NAD	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$?	B 1	F	3rd Floor Corridor Expansion Caulk			7 67			NAD
	22-01-043-	198.4/6	G	And the tradition of the tradition of the tradition			5			
$ \begin{vmatrix} h & WH & E \\ \hline H & F \\ \hline B & 1 & F \\ \hline C & 198.4/6 & G \\ \hline B & 1 & F \\ \hline B & 1 & F \\ \hline B & 1 & F \\ \hline C & 198.4/6 & G \\ \hline D & H & \hline H \\ \hline A & B & E \\ \hline D & H & \hline H & \hline H \\ \hline A & W & E \\ \hline D & H & \hline H & H \\ \hline A & T & E \\ \hline D & H & \hline H & H \\ \hline A & T & E \\ \hline D & H & \hline H & H \\ \hline A & T & E \\ \hline A & T & E \\ \hline B & 1 & F \\ \hline D & H & \hline H & H \\ \hline A & T & E \\ \hline B & 1 & F \\ \hline D & H & \hline H & H \\ \hline A & T & E \\ \hline A & T & E \\ \hline H & I & F \\ \hline H & H & \hline H & H \\ \hline A & T & E \\ \hline H & I & F \\ \hline H & H & \hline H & H \\ \hline A & T & E \\ \hline H & I & F \\ \hline H & H & \hline H & H \\ \hline H & H & \hline $	98		H				26. °			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	00	and the second s	ш			12 M. A.		INC. NAD	NAD	
		B 1	Ц	3rd Floor Corridor Evnansion Cault	Veren		137			NAD
DHNNNABKE $NC.NAD$ $NC.NAD$ $NC.NAD$ BIF 3.03 $NC.NAD$ $NC.NAD$ C198.4/6G $NC.NAD$ $NC.NAD$ $NC.NAD$ DTE $NC.NAD$ $NC.NAD$ $NC.NAD$ ATE $NC.NAD$ $NC.NAD$ $NC.NAD$ ATE $NC.NAD$ $NC.NAD$ $NC.NAD$ ATE $NC.NAD$ $NC.NAD$ $NC.NAD$ BIF $NC.NAD$ $NC.NAD$ $NC.NAD$ ABKE $NC.NAD$ $NC.NAD$ $NC.NAD$ BF $NC.NAD$ $NC.NAD$ $NC.NAD$ $NC.NAD$ BF $NC.NAD$ $NC.NAD$ N	22-01-043-	198.4/6	G 🖉				10.1			1
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	66		H		6					
	100		E	200°				INC. NAD	NAD	
	1001	B 1	~18	3rd Floor, Room 352, Mastic Under			3 03			U V V
DHHPPATE $\mathbb{NC.NAD}$ $\mathbb{NC.NAD}$ $\mathbb{NC.NAD}$ B1F $\mathbb{NC.NAD}$ $\mathbb{NC.NAD}$ $\mathbb{NC.NAD}$ C198.4/6G \mathbb{NA} \mathbb{NA} $\mathbb{NC.NAD}$ \mathbb{NA} ABKE \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} ABKE \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} B1F \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} C198.4/6G \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} D \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} D108.4/6G \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} D198.4/6G \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} DHH \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} D198.4/6G \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} DHH \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} DHH \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} DHHH \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} \mathbb{NA} D<	22-01-043-	198.4/6	G 🖉	12x12 Tan Tile						
	100		H							
	101		<u>ы</u>					INC. NAD	NAD	
	101	B 1	Ĺ	3rd Floor, Room 352, 12x12 Tan Tile			101			
D H F	22-01-043-	198.4/6	0	W/ Blue Specks		Sector	10.1			
A BK E INC.NAD B 1 F INC.NAD B 1 F INC.NAD C 198.4/6 G 24.62 D H 24.62 10	101		Й _							
B 1 F 2nd Floor, Room 206, Mastic Under C 198.4/6 G 12x12 Tan Tile D H 12x12 Tan Tile	103	BK	E					INC, NAD	NAD	
C 198.4/6 G 12x12 Tan Tile D H	4) 1	B 1	Ŀı	2nd Floor, Room 206, Mastic Under			69 86			
D	22-01-043-	198.4/6	G	12x12 Tan Tile			10.14			
	102		H							

BULK ASBESTOS TEST REPORT

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Client/Addr	Client/Address: Omega Environmental/280 Huyler St.,	onmental/	280 Huyler St., So. Hackensack, NJ 07606	Γ	Project: 65 Siwanoy Blvd	oy Blvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
103	A T E						INC. NAD	NAD	
	B 1 F		2nd Floor, Room 206, 12x12 Tan Tile			10.70			U V D
22-01-043-	C 198.4/6 G		W/ Blue Specks	×.		10.17			action of the second se
103	D H								
104	A Y E						INC. NAD	NAD	
	B 1 F		3rd Floor, Room 313, Mastic Under			60.00	4073		U V N
22-01-043-	C 198.4/6 G		12x12 White Tile			000			ach
104	D H								
105	A WH E						INC. NAD	NAD	
001	B Ì F		3rd Eloor: Boom 313, 12v12 White Tile	Y		58 64			UAN
22-01-043-	C 198.4/6 G			s energia					
105	D H			1					
106	A Y E		·) ???				INC. NAD	NAD	
001	B I F		1st Floor, Principal Office, Mastic			58 75			U V N
22-01-043-	C 198.4/6 G		Under 12x12 White Tile			01.00			acti
106	D H	and the second se							
107	A WH E	1916					INC. NAD	NAD	
	B 1 F		1st Floor, Principal Office, 12x12	Å		5162			UVN
22-01-043-	C 198.4/6 G		White Tile			00.10			
107	D								
108	A GR E				NAD				
	B 1 F		2nd Floor, Library, Leveling	100 00					NAD
22-01-043-	C 198.1 G		Compound	00.001					
108	D H								

BULK ASBESTOS TEST REPORT

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Client/Addr	ess: Omega En	vironmental	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606	506	Project: 65 Siwanoy Blvd	by Blvd	Pro	Proj#: 22-1037	
Laboratory	Laboratory ID: 22-01-043		Date of Report: 02/03/22		Date of Analysis: 01/25/22, 01/27/22	01/25/22,	01/27/22		
Client ID # Lab ID #	Stereomicroscope Analysis	ope Analysis	Sample Description	% Non- Fibrous Material	% Friable Results	% AII	% PLM NOB Results	% *TEM NOB Results	% TOTAL Asbestos
001	A GR	ш			NAD				
601	B 1	Ŀ	2nd Floor, Library, Leveling	100.00					NAD
22-01-043-	C 198.1	G	Compound	00.001					
109	D	H							
OT.	A GN	ш					INC. NAD	NAD	
2	B 1	F	2nd Bloom I ihmmun Clino I Indon Council		1	16.00	2 0 J		UVN
22-01-043-	C 198.4/6	G	Zing Frout, Lionary, Olde Oliger Carper			2.21			
110	Q	Н				× ×			
	AGN	Е					INC. NAD	DAD	
	B 1	F	and Elocar I throw Cline Hadee Comme	K K		36 36			U V N
22-01-043-	C 198.4/6	0	ZIIU FIOUI, LIUIAIY, UIUE UIUEI CAIPEI	r Verilier Konst		0000			
111	D	H		à s					
117	A GR	E	200		NAD				
717	B 1	F	Facado Exterior Decomptive Stone	100.00	-				NAD
22-01-043-	C 198.1	G	raçade, Exterior, Decorative Storie	00.001					
112	D	H							
113	A GR	ш			NAD				
	B 1	۲. ۲.	Forodo Exterior Decorative Stone	100.001					NAD
22-01-043-	C 198.1	G		NO:OD I	Sector				}
113	D	Ĥ							
V11	A GR	<u>ц</u>			NAD				
	B 1	F	Façade, Exterior, Decorative Stone-	100.00					NAD
22-01-043-	C 198.1	G	Mortar	100.001]
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BULK ASBESTOS TEST REPORT

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	% TOTAL Asbestos	NAD	NAD	
Proj#: 22-1037	% *TEM NOB Results			
	% PLM NOB Results			
y Blvd 01/25/22, (% AII	I		
Project: 65 Siwanoy Blvd Date of Analysis: 01/25/22, 01/27/22	% Friable Results	NAD	UAD CAN	
	% Non- Fibrous	100.00	100.00	
Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606 Laboratory ID: 22-01-043 Date of Report: 02/03/22	Sample Description	Façade, Exterior, Decorative Stone- Mortar	Façade, Exterior, Decorative Stone- Mortar	
ss: Omega Environmental/2 D: 22-01-043	Stereomicroscope Analysis	A GR E B 1 F C 198.1 G D H	A GR E B I F C 198.1 G D H	
Client/Address: Omega En Laboratory ID: 22-01-043	Client ID # Lab ID #	115 E 22-01-043- 115	116 <u>F</u> <u>16</u> <u>16</u> 22-01-043- <u>16</u> 116 <u>1</u>	

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LABORATORY DIRECTOR M. Young ELAP 6.3.2.2. Polarized-light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron Above results relate only to samples submitted and analyzed. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any U.S. Government Proj#: 22-1037 *TEM-NOB was subcontracted and analysis was performed by Laboratory Testing Services Inc. at 45-09 Greenfount Ave, LIC, NY 11104 ELAP ID # 10955, NVLAP Lab Code 101958, Color: BK: Black, BR: Brown, Dk BR: Dark Brown, Lt BR: Light Brown, R BR: Reddish Brown, GR: Gray, Dk GR: Dark Gray, Lt GR: Light Gray, BE: Beige, P: Pink, R: Red, T: Tan, Analytical Methodologies: ELAP Method 198.1, 198.6, EPA 600/M4-82-020, as found in 40 CER, Part 763, App E to Subpart E, and EPA/600/R-93/116 (Point Count only). Date of Analysis: 01/25/22, 01/27/22 TEM-NOB ANALYST Project: 65 Siwanoy Blvd microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing. Stereomicroscopic Analysis: A: Color, B: Layers, C: Methodology, D: Cellulose, E: Fiberglass, F: Hair, G: Vermiculite, H: OTHER LABORATORY ACCREDITATION NUMBERS: NYSDOH ELAP LAB ID 12005 and NVLAP Lab Code 600253-0 Samples will be stored for sixty (60) days. LTS Inc. should be notified within this time frame for a true duplicate analysis. CH: Chrysotile, AMOS: Amosite, TRE: Tremolite, ANTH: Anthophyllite, ACT: Actinolite, and CRO: Crocidolite. WH: White, Off WH: Off White, Y: Yellow, BL: Blue, CR: Cream, GN: Green, O: Orange, Multi.: Multiple Colors The liability of LTS Inc., with respect to the services charged, shall in no event exceed the amount of the invoice. INC.: Inconclusive, NAD: No Asbestos Detected, NVD: No Vermiculite Detected, SAFP: Stop at First Positive Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606 agency. Test reports may not be reproduced except in full and with prior approval of LTS Inc. **PLM-NOB ANALYST** Date of Report: 02/03/22 M. Young Director: Emanuel Dimitrakas Laboratory ID: 22-01-043 PLM ANALYST M. Young

BULK ASBESTOS TEST REPORT

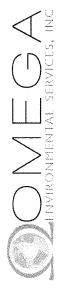
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	CHAIN OF CUSTODY/ANALYSIS REQUEST FOR ASBESTOS BULK SAMPLES

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nega-env.	d Time Re	amples:	each indi	samples v	Stop after 1st positive for each homogeneous area	t of	f bətemitz∃ layers						2 of 2	1 of 2													
<u>eddym@omega-env.com</u>	Turnaround Time Requested:	Total # of Samples:	Analyze by each individual layer or as indicated	Analyze all samples without 1 st positive stop	S		Quantity	3,000 SF	6,000 SF	6,000 SF	6,000 SF	6,000 SF	6,000 SF	6,000 SF	6,000 SF	6,000 SF 1 of 2	6,000 SF	6,000 SF	6,000 SF 1 of 2	6,000 SF 1 of 2	6,000 SF	ompany:	Q				
and		<u> </u>					General Condition	+	NVD	DVD	NVD	NVD	Damaged	Received By Company: Date & Time:	1200												
: lab@omega-env.com							Description of Homogeneous Material (type. color. size. etc)	Spray On Fire Profing - Fluffy	Ceiling Plaster Brown Coat	Ceiling Plaster White Coat	Omega Environmental 19:00PM	8 Plm 38 Plm/122															
ults to							#¥ H	ъ			H	1	2	2	2	2	2	2	2	т 	ж —	3	3	3	3	July motor	84
email results to:	cts		65 Siwanoy Blvd Eastchester, NY 10709	a 13-12147	7:00 AM - 7:00PM		Location (Room. Area. etc)	Class 352	Class 351	Class 250	Corridor	Class 151	Corridor	Eddy Montoya													
	KG&D Architects	22-1037	65 Siwanoy Bl	Eddy Montoya 13-12147	1/22/22		Floor/Level		3rd Floor	Ι.	2nd Floor	1st Floor	3rd Floor	3rd Floor	3rd Floor	2nd Floor	2nd Floor	1st Floor	1st Floor	3rd Floor	3rd Floor	3rd Floor	2nd Floor	2nd Floor	1st Floor		
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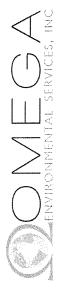


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Sample #	Lab ID #	Floor/ Level	Location [] [Room, Area, etc]	() HA#	Description of Homogeneous Material (type, color, size, etc)	terial General Condition	ral ion Quantity	nite∃	הרע 	1-MJ9	TEM-I	Other A	Notes and Comments
19		1st Floor	Corri		Ceiling Plaster White Coat	Damaged		6,000 SF 1 of 2	©¥		0	0	(-)NAD, NVD
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35		1st Floor	Cafeteria	9	Drywall	DVN	4,50	4,500 SF	¥			-	
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37		2nd Floor	Library	7	Joint Compound	DVD	4,50	4,500 SF	1	0	0		
38		1st Floor	Cafeteria	7	Joint Compound	DVN	4,50	4,500 SF	*				
39		1st Floor	Cafeteria	7	Joint Compound	DVN	4,50	4,500 SF	¥ 100				
40		3rd Floor	Classroom - Soffit	7	Joint Compound	DVN	4,50	4,500 SF	1 1				>
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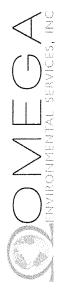
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41		3rd Floor	Classroom - Soffit		-	Joint Compound	DVD	4,500 SF	Ч	ø	٥		0	(-)NAD
42		2nd Floor	Classroom - Soffit		~	Joint Compound	DVD	4,500 SF		1 49	0	٥	٥	
43		3rd Floor	MER 317A			Terracotta	DVD	3,200 SF	1	YØ	0	D	0	
44		1st Floor	Corridor		∞	Terracotta	DVD	3,200 SF		×	۵	0	0	
45		3rd Floor	MER 317A		6	Terracotta - Mortar	DVD	3,200 SF	1	×	0	0	٥	
46		3rd Floor	MER 313		6	Terracotta - Mortar	DVD	3,200 SF	1	*	0	٥	٥	
47		2nd Floor	Corridor		6	Terracotta - Mortar	DVD	3,200 SF	1	b ea	0			
48		2nd Floor	Corridor		6	Terracotta - Mortar	DVD	3,200 SF		¥		o	٥	
49		1st Floor	Corridor		<u>б</u>	Terracotta - Mortar	DVD	3,200 SF	-	M	_	٥	٥	
50		3rd Floor	MER 317A		10	Red Brick	DVD	4,700 SF	-	¥	_	0	۵	
51		1st Floor	Corridor		10	Red Brick	DVD	4,700 SF	1	*			D	
52		3rd Floor	MER 317A		11	Red Brick - Mortar	DVD	4,700 SF	-	•	٥	۵		
53		3rd Floor	MER 313		11	Red Brick - Mortar	DVD	4,700 SF		×		۵	0	
54		2nd Floor	Corridor		11	Red Brick - Mortar	DVD	4,700 SF	, ,	×	٥	٥	٥	
55		2nd Floor	Corridor		11	Red Brick - Mortar	DVD	4,700 SF		₽	٥	٥	D	
56		1st Floor	Corridor		11	Red Brick - Mortar	DVD	4,700 SF		1 A	0	٥	_	
57		2nd Floor	Library		12	CMU	NVD	2,200 SF		×		٥	٥	
58		3rd Floor	MER 313		12	CMU	DVD	2,200 SF		×	_		٥	
59		2nd Floor	Library		13	CMU - Mortar	DVD	2,200 SF		4	0	٥	a	
60		3rd Floor	MER 313		13	CMU - Mortar	NVD	2,200 SF		7		0	0	
61		1st Floor	Staircase		13	CMU - Mortar	DVD	2,200 SF		*		0	0	
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Sample # Lab ID #	Floor/ Level	el (Room, Area, etc)		HA#	Description of Homogeneous Material (type, color, size, etc)	General Condition	Quantity	sg	l 	Ъd	IJT	əqiO	Notes and Comments
		Corric			CMU - Mortar	NVD	2,200 SF		Å		٥	٥	(-11/1-)
64	3rd Floor	Cut Zone		14	Terrazzo Flooring	DVD	4,800 SF		X	٥	٥	٥	
65	2nd Floor	Cut Zone		14	Terrazzo Flooring	DVD	4,800 SF		عر ب	0	٥	D	\rightarrow
66	3rd Floor	Corridor		15 (Giue Dullops - Brown	DVD	3,900 SF		1	۶	×	0	F)~40 (-1NAD
67	1st Floor	Cafeteria		15	Glue Dullops - Brown	DVD	3,900 SF		1 0	ł	7	D	シン
68	3rd Floor	Corridor		16	Fiberglass Pipe Wrap	DVD	290 Ln FT		4	٥	٥	۵	(-11/Ar)
69	2nd Floor	Corridor		16	Fiberglass Pipe Wrap	NVD	290 Ln FT		1 R	0	٥	٥	
70	1st Floor	Corridor		16	Fiberglass Pipe Wrap	DVD	290 Ln FT		₽	0	_	٥	→
71	2nd Floor	Library		17	2x4 Design Ceiling Tile	NVD	550 SF		1	¥	>		(-)~ 49, (-)NAD
72	2nd Floor	Library		17	2x4 Design Ceiling Tile	NVD	550 SF		1	¢	*	٥	
73	3rd Floor	Corridor		18	2x2 Ceiling Tile - Fiberglass Wrap	DVD	1,800 SF		1	11	~¢	_	
74	2nd Floor	Corridor		18	2x2 Ceiling Tile - Fiberglass Wrap	NVD	1,800 SF		1	\$	¥	٥	→ →
75	3rd Floor	Corridor		19	Fiberglass Duct Wrap	NVD	2,300 SF		¥	0		0	(-)WAS
76	2nd Floor	Corridor		19	Fiberglass Duct Wrap	DVD	2,300 SF		н 1	0	٥	٥	
77	1st Floor	Corridor		19	Fiberglass Duct Wrap	DVD	2,300 SF		1 ¥	٥	0		~
78	1st Floor	Cafeteria		20	2x1 Ceiling Tile	Damaged	3,300 SF		1 0	¥	×	٥	(-)NAD, (-)NAD
79	1st Floor	Cafeteria		20		Damaged	3,300 SF		1	Ya	¥	0	
80	1st Floor	Cafeteria		21	1x1 Ceiling Tile	Damaged	3,300 SF		-	¥	*	_	
81	1st Floor	Cafeteria		21	1x1 Ceiling Tile	Damaged	3,300 SF		1	¢	*	٥	
82	2nd Floor	Library		22	2x4 Fischer Ceiling Tile	DVD	380 SF		1	¥	*		
83	2nd Floor	Library		22	2x4 Fischer Ceiling Tile	DVD	380 SF		а н	-8	*	-	
84	3rd Floor	Room 352		23	2x2 Ceiling Tile - Pinholes	DVD	900 SF			d)	-6		> >
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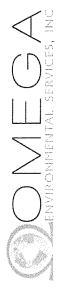
ENVIRONMENTAL SERVICES, INC

280 Huyler Street South Hackensack, NJ 07606 T 201.489.8700 F 201.342.5412 website www.omega-env.com

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3 of floor Weight RoomMER 24 Pink Fire Stop Caulk WD 125 1 \bullet <			RM 3		2x2 Ceilir			900 SF	1	0	X	4	0	(F)NAD	ONNES
3 of floor Weight Rooom-MER 24 Pink Fie Stop Caulk MO 135 2 of e <td>86</td> <td>3rd Floor</td> <td>Weight Rooom - MI</td> <td></td> <td>Pink Fire Stop Caulk</td> <td>Z</td> <td>DA</td> <td>12 SF</td> <td>1</td> <td></td> <td>4</td> <td>ę</td> <td>0</td> <td></td> <td>(-) TR CH</td>	86	3rd Floor	Weight Rooom - MI		Pink Fire Stop Caulk	Z	DA	12 SF	1		4	ę	0		(-) TR CH
	87	3rd Floor	Weight Rooom - Ml		Pink Fire Stop Caulk	ź	۵۷	12 SF	H		À	Q	0		(-) NAD
Jed Floor Ibravy 26 Bile Cove Base WD 130 SF 161 S P K P P Jed Floor Ibravy 25 Bile Cove Base Glue WD 130 SF 261 S P K P	88	2nd Floor	library		Blue Cove Base Glue	Ź	VD		2 of 2	٥	4	×	0		
2 but filorlitrary25Blue Cove BaseWVD1305 2 of 2 a <	68	2nd Floor	library	26		Ż	٨D		1 of 2	٥	·X	×	0		
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LABORATORY TESTING SERVICES INC. 45-09 Greenpoint Ave. LIC, NY 11104 Phone: (718) 389 3470, Fax: (718) 389 3471

scope Analysis Sample Description % Non- Fibrous % Friable Results % All Results % Frem NOB Results % TEM NOB Results <th></th> <th>Client/Address: Omega Er Laboratory ID: 22-02-233 I</th> <th>ënviron 3</th> <th>mental/2</th> <th>Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606 Laboratory ID: 22-02-233 Date of Report: 02/28/22</th> <th>06</th> <th>Project: Tuckahoe Middle School Date of Analysis: 02/25/22</th> <th>e Middle S 02/25/22</th> <th></th> <th>ject #:</th> <th>Project #: 22-1037</th> <th></th> <th></th>		Client/Address: Omega Er Laboratory ID: 22-02-233 I	ënviron 3	mental/2	Client/Address: Omega Environmental/280 Huyler St., So. Hackensack, NJ 07606 Laboratory ID: 22-02-233 Date of Report: 02/28/22	06	Project: Tuckahoe Middle School Date of Analysis: 02/25/22	e Middle S 02/25/22		ject #:	Project #: 22-1037		
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BULK ASBESTOS TEST REPORT

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BULK ASBESTOS TEST REPORT

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PLM ANALYST

501 2 as Divideal PLM-NOB ANALYST

Y. Selevich

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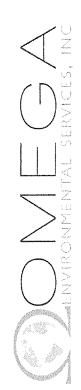
Sy Dice trakes

TEM-NOB ANALYST E. Loukianova

LABORATORY DIRECTOR E. Dimitrakas

LABORATORY ACCREDITATION NUMBERS: NVLAP Lab Code 101958-0, NYSDOH ELAP Lab ID 10955

- Samples will be stored for sixty (60) days. LTS Inc. should be notified within this time frame for a true duplicate analysis.
- Above results relate only to samples submitted and analyzed. This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. Test reports may not be reproduced except in full and with prior approval of LTS Inc.
- The liability of LTS Inc., with respect to the services charged, shall in no event exceed the amount of the invoice.
- Analytical Methodologies: EPA 600/M4-82-020 (Point Count only) and ELAP Methods 198.1, 198.4, 198.6.
- NAD: No Asbestos Detected, NVD: No Vermigulite Detected, SAFP. Stopped at First Positive, CH: Chrysotile, AMOS: Amosite, TRE: Tremolite, ANTH: Anthophyllite, ACT: Actinolite, and CRO: Crocidolite.
 - Stereomicroscopic Analysis: A: Color, B: Layers, C: Methodology, D: Cellulose, E: Fiberglass, F: Hair, G: Vermiculite, H: OTHER
- Color: BK: Black, BR: Brown, Dk BR: Dark Brown, Lt BR: Light Brown, R BR: Reddish Brown, GR: Gray, Dk GR: Dark Gray, Lt GR: Light Gray, BE: Beige, P: Pink, R: Red, T: Tan, WH: White, Off WH: Off White, Y: Yellow, BL: Blue, CR: Cream, GN: Green, O: Orange, Multi.: Multiple Colors

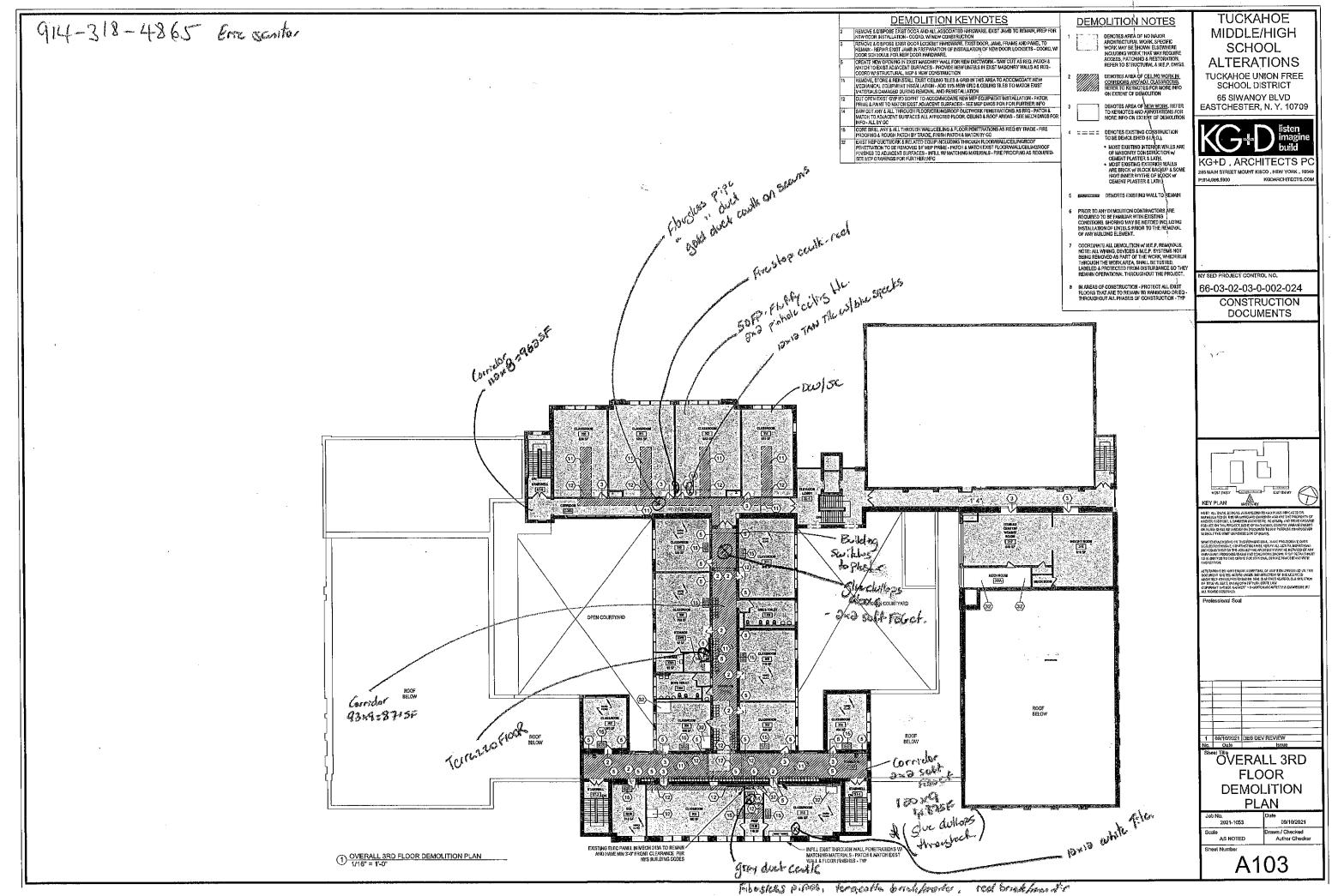


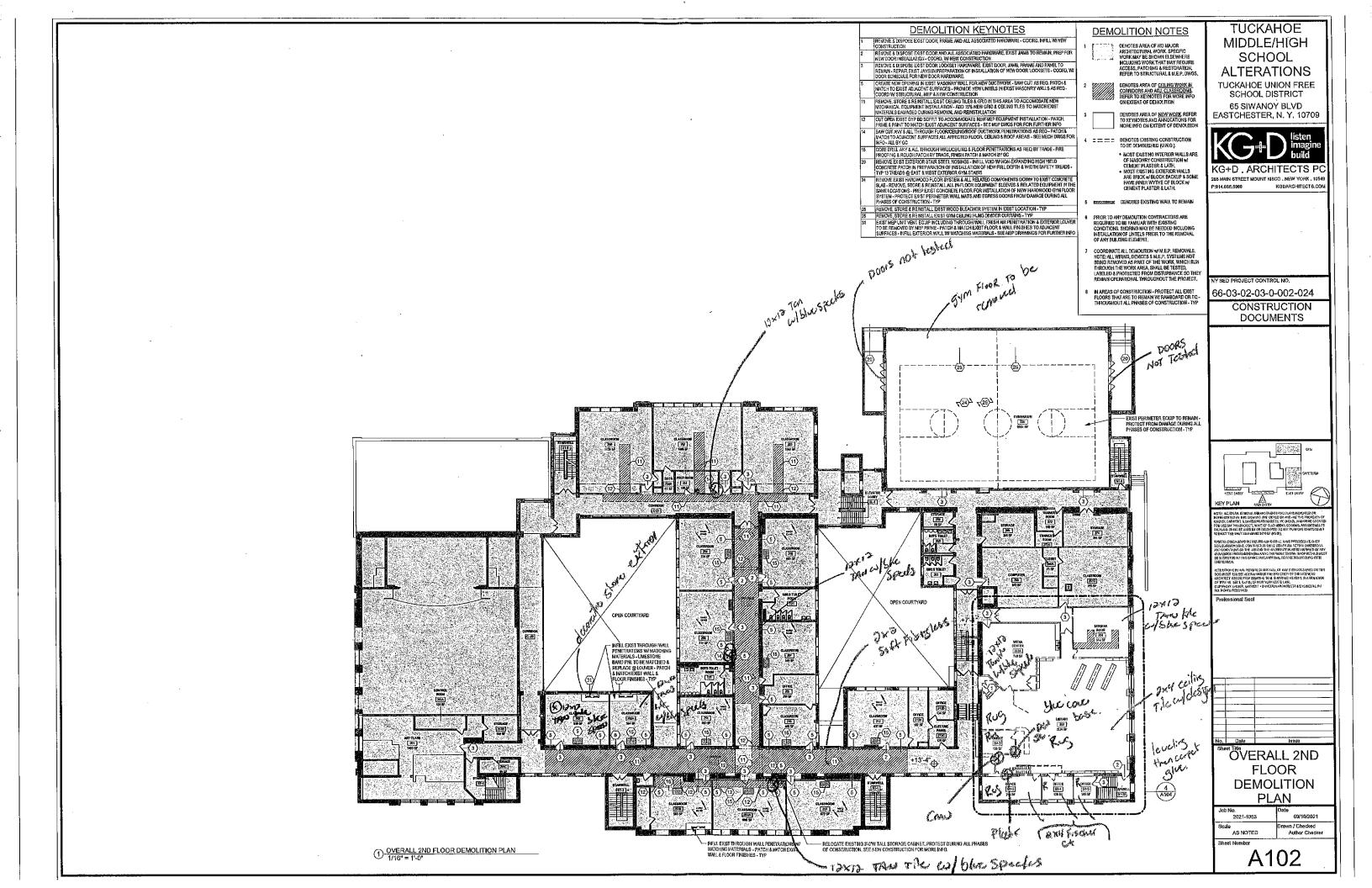
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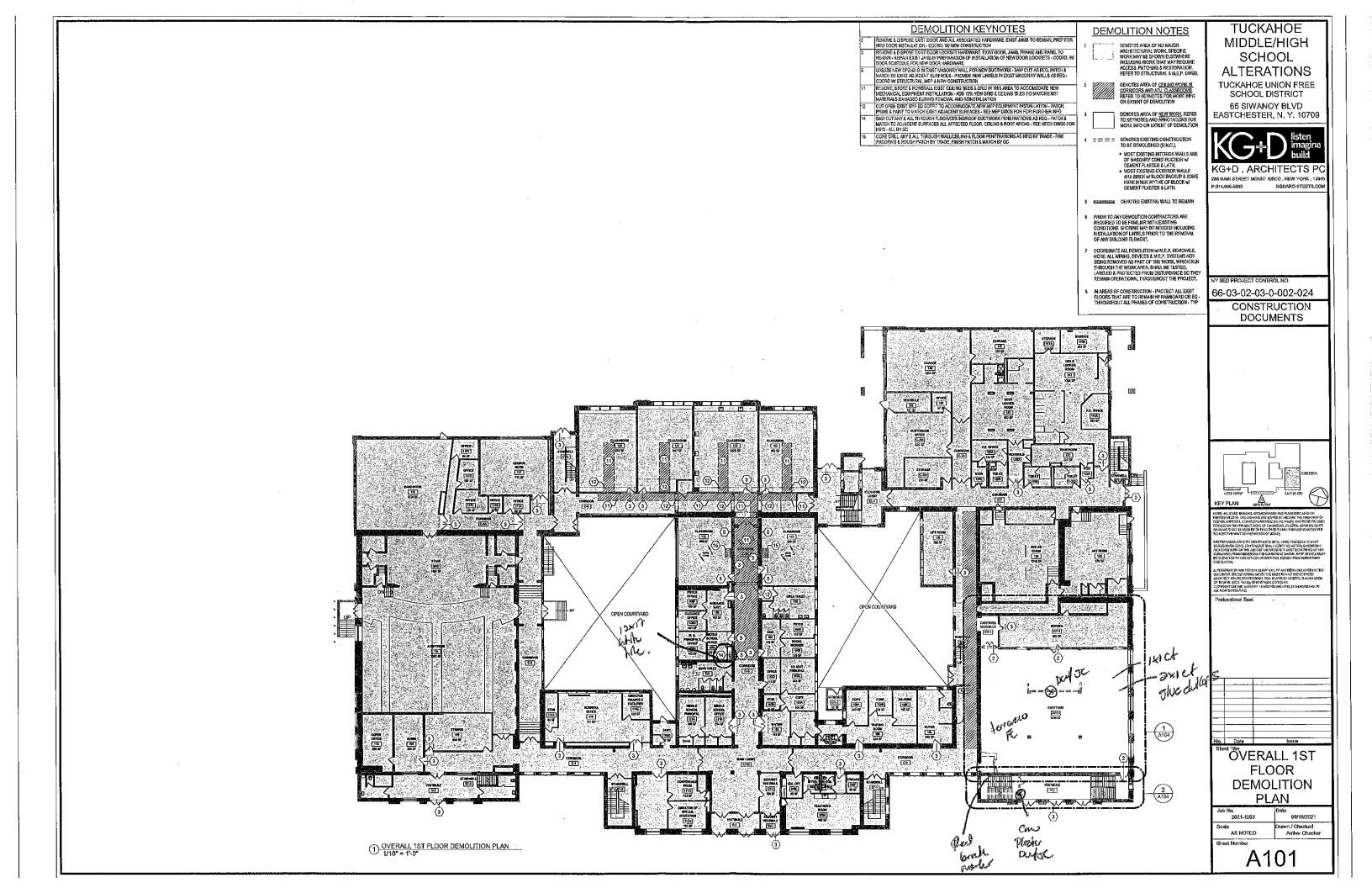
CHAIN OF CUSTODY/ANALYSIS REQUEST FOR ASBESTOS BULK SAMPLES

email results to: <a>[ab@omega-env.com] and <a>[ab@omega-env.com]

Total # of Samples:	Analyze by each individual layer or as indicated	Analyze all samples without 1 st positive stop	Stop after 1^{st} positive for each homogeneous area	Estimated # of layers PLM-NOB TEM-NOB PLM-NOB			X C-IMAN / C-	\uparrow \land \uparrow \land \land \land \land		22) Forhiner Jed Tucking
Second and				Description of Homogeneous Area (type, color, size, etc) General Condition	lack restric Geed TBD	2	7	A A		Received By Company Date & Time:
teor - nor - teor	e gehoul		2020	Location (Room, Area, etc) #AH	CYM I &	1	2 1	V V		1 2/22/22/2
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SECTION 004100

PROPOSAL FORM

PROJECT: Tuckahoe Union Free School District Middle School/High School Reconstruction 65 Siwanoy Blvd Eastchester, NY 10709

DATED: _____

To: Faith Sparks, Business Manager Tuckahoe UFSD District Office 65 Siwanoy Blvd Eastchester, NY 10709

Greetings:

The Undersigned, in compliance with the Invitation and Instructions to Bidders, agrees that if this bid is accepted as hereinafter provided he/she will provide all labor, materials, supplies, tools, plant and equipment necessary to perform all work required for the construction of the aforementioned project in accordance with documents as prepared by Kaeyer, Garment and Davidson, Architects, P.C.; 285 Main Street, Mount Kisco, NY., Telephone: 914-666-5900 for the class of work at the aforementioned project as listed below:

(#1 - GENERAL CONSTRUCTION)	(#2 - HVAC)	(#3 - ELECTRICAL)
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(Each Bidder shall indicate in line above, class of work the Proposal is being submitted for.)

for the following LUMP SUM COST as applicable to the particular contract:

_____Dollars (\$______)

Further, the undersigned:

- agrees to execute alternates selected for the sums (additive or deductive) set forth in the attached schedule of Alternate Proposals.
- agrees to the stated percentages for extra work if ordered on a Time and Material basis in accordance with Article 7 of the Conditions to cover all overhead and profit allowance.
- Takes notice of the time constraints set forth in Section 011000 and agrees to the terms of the Contract.

It is understood that the Owner reserves the right to accept or reject any and all bids that the Owner deems to be in his best interest.

Upon notification of acceptance of this proposal, the undersigned agrees to execute a contract in the form as stated within these contract documents for the amount stated.

Prices quoted shall be guaranteed for forty-five (45) days after date of proposal.

If written Notice to Proceed, Letter of Intent or Contract is received within forty-five (45) calendar days after the opening of bids, the undersigned agrees to execute said contract and furnish to the Owner within ten (10) days after receipt of said notice of award, the executed Contract, together with the Performance Bond, Labor and Material Payment Bonds and Insurance Certificates required herein.

The Undersigned agrees that the Bid Security payable to Owner accompanying this proposal is left in escrow with the Owner; that its' amount is the measure of liquidated damages which the Owner will sustain by the failure of the Undersigned to execute and deliver the above named Bonds and Contract; and that if the undersigned defaults in furnishing said bonds or in executing and delivering said Contract within ten (10) days of written notification of award of the Contract to him/her, then said Security shall be payable to the Owner for its' own account; but if this proposal is not accepted within said forty five (45) days of the time set for submission of Bids, or if the Undersigned executes and delivers said bonds and Contract, the Bid Security shall be returned to the Undersigned.

The following Addenda have been received. The noted modifications to the Bid Documents have been considered and all costs are included in the Bid Sum.

Addendum	Date	Acknowledgment

By submission of this Proposal, the undersigned acknowledges that they have read the milestone and schedule requirements, Section 011000, and agrees to provide sufficient staff and organization as well as to select subcontractors, suppliers and vendors to comply with the requirements for submittals, delivery dates, work periods and completion dates as specified.

The Undersigned hereby certifies that they are able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

NON-COLLUSIVE AFFIDAVIT

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

NON-COLLUSIVE BIDDING CERTIFICATION

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

- 1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- 2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to the opening, directly or indirectly, to any other bidder or to any competitor; and
- 3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- b. A bid shall not be considered for award nor shall any award be made if (a)1, 2 and 3 above, have not been complied with; provided, however, that if any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore.
 Where (a)1, 2 and 3 above have not been complied with, the bid shall not be considered for award nor shall any award be made unless the head of purchasing unit of the political

for award nor shall any award be made unless the head of purchasing unit of the political subdivision, public department, agency or official thereof to which bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

Further, by submission of this Proposal

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

Respectfully submitted,

Contractor		
Ву	Title	
Business Name:		
Address:		
Telephone Number:		
Attest:	Title	
SEAL IF CORPORATION		

CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT

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

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

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

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

I,	, being du	ly sworn, deposes and
says that he/she is the		of the
nor any proposed subcontractor	Corporation and that is identified on the Prohibited Ent	neither the Bidder/ Contractor ities List.
SWORN to before me this	day of	SIGNED 2022
	OR	

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

Bidders shall complete this form if they cannot certify that the bidder /contractor or any proposed subcontractor is not identified on the Prohibited Entities List. The District reserves the right to undertake any investigation into the information provided herein or to request additional information from the bidder.

Name of the Bidder:

Address of Bidder ______

Has bidder been involved in investment activities in Iran?

Describe the type of activities including but not limited to the amounts and the nature of the investments (e.g. banking, energy, real estate):

If so, when did the first investment activity occur? _____

Have the investment activities ended? _____

If so, what was the date of the last investment activity? _____

If not, have the investment activities increased or expanded since April 12, 2012?

Has the bidder adopted, publicized, or implemented a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran?

If so, provide the date of the adoption of the plan by the bidder and proof of the adopted resolution, if any and a copy of the formal plan.

In detail, state the reasons why the bidder cannot provide the Certification of Compliance with the Iran Divestment Act below (additional pages may be attached):

I, _____ being duly sworn, deposes and says that he/she is the

_____ of the _____ Corporation and the foregoing is true and accurate.

SIGNED

SWORN to before me this _____ day of _____2022

Notary Public: _____

ATTACHMENT #1 - SCHEDULE OF ALTERNATE PROPOSALS

In accordance with the terms and conditions of the Contract and the Proposal Form, the undersigned agrees to execute alternates selected for the sums set forth in the following schedule of Alternate Proposals in accordance with the general description outlined in Section 01 23 00.

- A. Alternate #1: State the amount to be added to the Base Bid for the provision of HVAC DOAS UNITS #3, 4, & 5, related ACCU units 2, 3, 6, 7 & 8 and related indoor heat pumps, refrigerant and condensate piping, ductwork and accessories, registers, power, fire alarm and controls & any & all demolition & patching coordinate with all MEP drawings
 - 1. Contracts Affected: 1 General Construction, 2 HVAC, 3 Electrical

ADD_			

_____Dollars (\$______)

B. Alternate #2: State the amount to be added to the Base Bid for the provision of HVAC DOAS UNITS #,1 & 2, related ACCU units 1, 4 & 5 and all related indoor heat pump units, refrigerant and condensate piping, ductwork and accessories, registers, power, fire alarm and controls, etc. & any & all demolition & patching - coordinate w/ all MEP drawings

1. Contracts Affected: 1 - General Construction, 2 – HVAC , 3 – Electrical

ADD_____

_____Dollars (\$______)

- C. Alternate #3: State the amount to be added to the Base Bid for removal and replacement of the existing gymnasium hardwood flooring system, temporary removal, storage, and reinstallation of existing wood bleacher system, and temporary removal, storage and reinstallation of existing ceiling hung divider curtains
 - 1. Contracts Affected: 1 General Construction

ADD_____

____Dollars (\$_____)

D. Alternate #4: State the amount to be added to the Base Bid for work related to cleaning, repointing & restoration of existing cast stone lintels and repair and/or replacement of the existing steel lintels of TUFSD - HS - EAST entrance as shown on 1/A302 & related photographs

1. Contracts Affected: 1 - General Construction

ADD_____

Dollars	(\$)
	(*/

- E. Alternate #5: State the amount to be added to the Base Bid for work related to cleaning, repointing & restoration of exist cast stone lintels and repair and/or replacement of the existing steel lintels of TUFSD HS WEST entrance as shown on 2/A302 & related photographs
 - 1. Contracts Affected: 1 General Construction

ADD_____

_____Dollars (\$______)

End of Alternate Schedule

End of Proposal Form

SECTION 004513

BIDDER QUALIFICATION STATEMENT

After receipt of bids and upon notification from the Architect, the bidder shall answer all questions set forth in the form within the time required in Article 1.07 of the Invitation and Instructions to Bidders. Failure to answer these questions in full may be cause for rejection of the bidder's proposal. If more space is required, please attach additional sheets.

- 1. How many years has your organization been in business under your present business name?
- 2. How many years experience in construction work of a similar type has your organization had? _____

 List below the construction projects your organization has under way as of this da
--

Contract Sum	Class of Work/%Complete	Name/Address of Owner	Name & Phone # of Contact at Owner

4. List below a minimum of three (3) projects which your firm, <u>as a firm</u>, has performed in the past five (5) years which you feel will qualify you for this work.

Contract Sum	Class of Work/%Complete	Name/Address of Owner	Name & Phone # of Contact at Owner

Have you ever failed to complete any work awarded to you?
 □ Yes □ No; If Yes, where and why?

6. Has any officer or partner of your organization ever been an officer or partner of some other organization that failed to complete a construction contract?
Yes No; If Yes, state:

Name of Individual(s)	Name of	Reason(s)
	Owner(s)	

7. Has any officer or partner of your organization ever failed to complete a construction contract handled in his own name?

 \Box Yes \Box No; If yes, state:

Name of Individual(s)	Name of Owner(s)	Reason(s)
-----------------------	---------------------	-----------

8. Has your firm or organization ever received a Notice of Default or Notice of Termination or ever been defaulted or terminated on a Project.

The undersigned hereby authorizes and requests any firm, person or corporation to furnish any information requested by the Owner or Architect in verification of the matters contained in the Bidder Qualification Statement.

)

Dated _____, 20____

(Name of Bidder)

Ву _____

Title _____

<u>AFFIDAVIT</u>

STATE OF

004513 - 2 BIDDER QUALIFICATION STATEMENT

COUNTY OF	S.S.)
	being duly sworn and says that he/she is
of	(Name of Organization)
	errogatories and all statements therein contained are
Subscribed and sworn to before me	
this day of	_ 20
Signature	
Notary Public, County of	

End of Section

SECTION 004643

WAGE AND HOUR RATES

1.01 GENERAL

- A. The following are instructions for obtaining the minimum wage rates, health and welfare and pension fund contributions as determined by the Industrial Commissioner of the State of New York in accordance with the provisions of Section 220 of the Labor Law.
- B. All contractors will be bound and obligated by the Laws of New York State to insure payment to all workers involved with the construction of the Project.
- 1.02 MINIMUM WAGE RATES
 - A. The current wage and benefit rates are available when following the instructions on the attached page.

The "Request for Wage and Supplement Information" (PW 39) you have submitted has been accepted, and a Prevailing Rate Case Number (PRC# 2022000488 - Tuckahoe MS/HS Reconstruction) has been assigned to the project.

To access the PDF file of your schedule, click on

https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showIt&id=1525809 or copy and paste into your browser

AIA Document A132[®] – 2019

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

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

BETWEEN the Owner: *(Name, legal status, address, and other information)*

Tuckahoe Union Free School District 65 Siwanoy Blvd. Eastchester, NY 10709

and the Contractor: (Name, legal status, address, and other information)

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

Tuckahoe Middle School/High School Reconstruction 65 Siwanoy Blvd. Eastchester, NY 10709 SED # 66-03-02-03-0-002-024

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

Calgi Construction Management 56 Lafayette Avenue, Ste. 350 White Plains, NY 10603 Telephone 914.682.9420

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

KG+D Architects, P.C. 285 Main Street Mount Kisco, NY 10549 Telephone 914.666.5900

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:

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

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

This document is intended to be used in conjunction with AIA Documents A232[™]–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132[™]–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132[™]–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232[™]–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.

TABLE OF ARTICLES

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

EXHIBIT A INSURANCE AND BONDS EXHIBIT B DETERMINATION OF THE COST OF THE WORK

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

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

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

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

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be: (Insert the date of Substantial Completion of the Work of all Contractors for the Project.)

2

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

Portion of Work Substantial Completion Date

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

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract: *(Check one of the following boxes and complete the necessary information.)*

[] Not later than () calendar days from the date of commencement of the Work.

[] By the following date:

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work

Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

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

- [X] Stipulated Sum, in accordance with Section 4.2 below
- [] Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below
- [] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

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

§ 4.2 Stipulated Sum

§ 4.2.1 The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.

§ 4.2.2 Alternates

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

Item

Price

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

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§ 4.2.3 Allowances, if any,	included in the Contract Sum:	
(Identify each allowance.)		
Item	Price	
§ 4.2.4 Unit prices, if any: <i>(Identify the item and state a</i>)	the unit price, and quantity limitations, if any, to whi	ch the unit price will be applicable.)
Item	Units and Limitation	ns Price per Unit (\$0.00)
	s Contractor's Fee without a Guaranteed Maximum k is as defined in Exhibit B, Determination of the Co	
§ 4.3.2 The Contractor's Fe (State a lump sum, percenta	e: ge of Cost of the Work or other provision for determ	ining the Contractor's Fee.)
§ 4.3.3 The method of adjus	tment of the Contractor's Fee for changes in the Wo	rk:
§ 4.3.4 Limitations, if any, o	on a Subcontractor's overhead and profit for increase	es in the cost of its portion of the Work:
§ 4.3.5 Rental rates for Cont place of the Project.	ractor-owned equipment shall not exceed percent (%) of the standard rental rate paid at the
§ 4.3.6 Unit prices, if any: <i>(Identify the item and state a</i>)	the unit price and quantity limitations, if any, to which	ch the unit price will be applicable.)
Item	Units and Limitations	Price per Unit (\$0.00)
Agreement, a written Contro	prepare and submit to the Construction Manager, w ol Estimate for the Owner's review and approval. The Determination of the Cost of the Work.	
	s Contractor's Fee with a Guaranteed Maximum P k is as defined in Exhibit B, Determination of the Co	
§ 4.4.2 The Contractor's Fe (State a lump sum, percenta	e: ge of Cost of the Work or other provision for determ	ining 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:

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Price

5

§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed percent (%) of the standard rental rate paid at the place of the Project.

§ 4.4.6 Unit Prices, if any:

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

§ 4.4.7 Guaranteed Maximum Price

§ 4.4.7.1 The Contract Sum is guaranteed by the Contractor not to exceed (\$), subject to additions and deductions by Change Order as provided in the Contract Documents. This 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.

§ 4.4.7.2 Alternates

§ 4.4.7.2.1 Alternates, if any, included in the Guaranteed Maximum Price:

Item

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

§ 4.4.7.3 Allowances, if any, included in the Guaranteed Maximum Price: (Identify each allowance.)

Item

Item

§ 4.4.7.4 Assumptions, if any, upon which the Guaranteed Maximum Price is based: (Identify each assumption.)

§ 4.4.8 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Order.

§ 4.4.9 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in Section 4.4.7.4. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions contained in Section 4.4.7.4 and the revised Contract Documents.

§ 4.5 Liquidated damages, if any:

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

Init. 1



Price

Price

Conditions for Acceptance

Units and Limitations

Price per Unit (\$0.00)

Price

§ 4.6 Other:

(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and Certificates for Payment issued by the Construction Manager and Architect, the Owner shall make progress payments on account of the Contract Sum, to the Contractor, as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 15th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 15th day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than forty-five (45) days after the Construction Manager receives the Application for Payment.

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

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

§ 5.1.4.1 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.4.2 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.4.3 In accordance with AIA Document A232[™]−2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.4.3.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and
- .5 Retainage withheld pursuant to Section 5.1.7.

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§ 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 B, 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 payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor, plus payrolls for the period covered by the present Application for Payment, less that portion of the payments attributable to the Contractor's Fee.

§ 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 In accordance with AIA Document A232-2019 and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.5.3.1 The amount of each progress payment shall first include:

- .1 The Cost of the Work as described in Exhibit B, Determination of the Cost of the Work;
- .2 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- .3 The Contractor's Fee computed upon the Cost of the Work described in the preceding Section 5.1.5.3.1.1 at the rate stated in Section 4.3.2; or if the Contractor's Fee is stated as a fixed sum in Section 4.3.2 an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work included in Section 5.1.5.3.1.1 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

§ 5.1.5.3.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;
- .5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.5.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- .6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and 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 such action shall not be deemed to be a representation that (1) 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; (2) that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or (3) 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.

§ 5.1.5.7 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

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§ 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, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.

§ 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 Guaranteed Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Contractor's Fee.

§ 5.1.6.2.1 The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.6.2.2 The allocation of the Guaranteed Maximum Price under this Section 5.1.6.2 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.

§ 5.1.6.2.3 When the Contractor allocates costs from a contingency to another line item in the schedule of values, the Contractor shall submit supporting documentation to the Architect and Construction Manager.

§ 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 and for which the Contractor has made payment or intends to make 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 In accordance with AIA Document A232-2019, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.4.1 The amount of each progress payment shall first include:

- .1 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 most recent schedule of values;
- .2 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 completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- .4 The Contractor's Fee, computed upon the Cost of the Work described in the preceding Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work included in Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

§ 5.1.6.4.2 The amount of each progress payment shall then be reduced by:

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- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;
- .5 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
- .6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.6.5 The Owner and the Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and 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 such action shall not be deemed to be a representation that (1) 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; (2) that the Construction Manager or Architect have made exhaustive or continuous on-site inspections; or (3) 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.

§ 5.1.6.8 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due: (Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

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§ 5.1.7.1.1 The following items are not subject to retainage: (Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

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

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

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

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

§ 5.2 Final Payment

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

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and
- a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect. .2

§ 5.2.1.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

§ 5.2.2 Final Payment Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

§ 5.2.2.1 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 Article 12 of AIA Document A232-2019, 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 B, Determination of the Cost of the Work and a final Application for Payment; and
- a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect in .3 accordance with Exhibit B, Determination of the Cost of the Work.

§ 5.2.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

§ 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located. (Insert rate of interest agreed upon, if any.)

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ARTICLE 6 **DISPUTE RESOLUTION** § 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker. (If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232-2019, the method of binding dispute resolution shall be as follows: (Check the appropriate box.)

Arbitration pursuant to Article 15 of AIA Document A232–2019. []

[X] Litigation in a court of competent jurisdiction in Westchester County, NY.

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[] Other: (Specify)

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

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

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

§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price § 7.2.1 Termination

§ 7.2.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.2.1.2 Termination by the Owner for Cause

§ 7.2.1.2.1 If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232–2019, the Owner shall then only pay the Contractor an amount 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 Section 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum in that Section, 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;
- .3 Subtract the aggregate of previous payments made by the Owner; and
- .4 Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A232–2019.

§ 7.2.1.2.2 When the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, if the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232-2019, the amount, if any, to be paid to the Contractor under Article 14 of AIA Document A232-2019 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.1.2.1.

§ 7.2.1.2.3 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 7.2.1.2.1.1. 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. All Subcontracts, purchase orders and rental agreements entered into by the Contractor will contain provisions allowing for assignment to the Owner as described above.

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§ 7.2.1.3 Termination by the Owner for Convenience

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of or method for determining the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

§ 7.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019; in such case, the Contract Sum and Contract Time shall be increased as provided in Article 14 of AIA Document A232–2019, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Section 4.3.2 or 4.4.2, as applicable, of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

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

Superintendent of Schools and/or Superintendent of Business Tuckahoe Union Free School District 65 Siwanoy Blvd. Eastchester, NY 10709 Phone No. 914.337.5376

§ 8.3 The Contractor's representative: (*Name, address, email address, and other information*)

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

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132TM-2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A132[™]−2019, Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with AIA Document E203TM–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

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

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§ 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor's skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A132TM–2019, Standard Form of Agreement Between Owner and Contractor,
 - Construction Manager as Adviser Edition
- .2 AIA Document A132TM–2019, Exhibit A, Insurance and Bonds Exhibit
- .3 AIA Document A232[™]–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

(Paragraph deleted)

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

.5	Drawings		
	Number	Title	Date
.6	Specifications		
	Section	Title	Date Pages
.7	Addenda, if any:		
	Number	Date	Pages

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

- .8 Other Exhibits: *(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*
 - [] AIA Document A132TM–2019, Exhibit B, Determination of the Cost of the Work
 - [] AIA Document E235[™]–2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below: (Insert the date of the E235-2019 incorporated into this Agreement.)
 - [] The Sustainability Plan:

	Title		Date	Pages	
[]	Supplementary and other Condit	upplementary and other Conditions of the Contract:		
	Docu	ment	Title	Date	Pages

.9 Other documents, if any, listed below: (List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232–2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement is entered into as of the day and year first written above.

OWNER (Signature)

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CONTRACTOR (Signature)

Tuckahoe UFSD BOE President (Printed name and title)

(Printed name and title)

SECTION 006100

BOND REQUIREMENTS

SEE ATTACHMENT TO SECTION FOR ACCEPTABLE BONDING COMPANY RATINGS

1.01 Prior to the Owner signing the contract agreement, he will require the Contractor (s) to furnish <u>separate</u> performance and labor and material payment bonds covering the faithful performance of the entire construction contract agreement.

The performance bond and the labor and material payment bond shall each be made out in one hundred percent (100%) of the guaranteed maximum contract amount.

1.02 The "Performance Bond" and "Labor and Material Payment Bond", A.I.A. Document A-312, as published by The American Institute of Architects shall be used and modified, if necessary, to comply with applicable statutes.

NOTE: Date of forms to be used shall be complementary to the date of the contract form and general conditions incorporated within these Bidding and Contract Requirements.

- 1.03 The bonds shall be signed by an official of the bonding company and shall be accompanied by the bonding agent's written power of attorney.
- 1.04 Provide four (4) copies each of the bonds and the power of attorney in order that one (1) copy of each may be attached to each copy of the contract agreement.
- 1.05 The Contractor (s) shall include in his/their proposal(s) amount the total premiums for the performance and labor and material payment bonds.

End of Section

Tuckahoe Union Free School District Middle School/High School Reconstruction

Section 006101 - Bonding Requirements

Acceptable Bonding Company Ratings

Contract Amounts (\$)	A.M. Best Company Rating							
Contract Amounts $(\mathbf{\mathfrak{F}})$	A + XII	B + XI	B + X	ВX	BIX	B VIII	B VII	B VI
10 Million and Over								
7.5 to 10 Million								
5.0 to 7.5 Million								
2.5 to 5.0 Million								
1.0 to 2.5 Million								
0.5 to 1.0 Million								
0.25 to 0.5 Million								
0.25 and Under								

\mathbf{AIA}° Document A310[°] – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address) **Tuckahoe Union Free School District** 65 Siwanoy Blvd. Eastchester, NY 10709

BOND AMOUNT: \$

PROJECT:

(Name, location or address, and Project number, if any) Tuckahoe Middle School/ High School Reconstruction 65 Siwanoy Blvd Eastchester, NY 10709 SED # 66-03-02-03-0-002-024

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

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

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so

ADDITIONS AND DELETIONS:

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

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

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

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

Signed and sealed this day of ,

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

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$\mathbf{W} \mathbf{AIA}^{\circ}$ Document A312[°] – 2010

Performance Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address) **Tuckahoe Union Free School District** 65 Siwanoy Blvd. Eastchester, NY 10709

CONSTRUCTION CONTRACT

Date: Amount: \$ 0.00 Description: (Name and location) Tuckahoe Middle/ High School Reconstruction 65 Siwanoy Blvd. Eastchester, NY 10709 SED # 66-03-03-02-0-002-024

BOND

Date: (Not earlier than Construction Contract Date)

Amount: \$ Modifications to this Bond: None See Section 16

CONTRACTOR AS PRINCIPAL Company: (Corporate Seal)	SURETY Company:	(Corporate Seal)
Signature:	Signature:	
Name and	Name and	
Title:	Title:	
(Any additional signatures appear)	on the last pa	ge of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone) AGENT or BROKER: **OWNER'S REPRESENTATIVE:** (Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

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

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

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

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as
- practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

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

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

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

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

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

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

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

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

§ 14 Definitions

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

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

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

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

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

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

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.) CONTRACTOR AS PRINCIPAL SURETY

Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

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$\operatorname{AIA}^{\circ}$ Document A312[°] – 2010

Payment Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address) Tuckahoe Union Free School District 65 Siwanoy Blvd. Eastchester, NY 10709

CONSTRUCTION CONTRACT

Date: Amount: \$ 0.00 Description: (Name and location) Tuckahoe Middle School/ High School Reconstruction 65 Siwanoy Blvd. Eastchester, NY 10709 SED # 66-03-02-03-0-002-024

BOND

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Date: (Not earlier than Construction Contract Date)

Amount: \$		
Modifications to this Bond:	None	See Section 18

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:		Signature:	
Name and		Name and	
Title:		Title:	

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

(FOR INFORMATION ONLY – Name, address and telephone) AGENT or BROKER: OWNER'S REPRESEN (Auchited Engineering)

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

ADDITIONS AND DELETIONS:

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

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable. **§ 1** The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

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§ 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

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- § 16.1 Claim. A written statement by the Claimant including at a minimum:
 - .1 the name of the Claimant;
 - .2 the name of the person for whom the labor was done, or materials or equipment furnished;
 - .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
 - .4 a brief description of the labor, materials or equipment furnished;
 - .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 - .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim:
 - .7 the total amount of previous payments received by the Claimant; and
 - .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

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

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

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

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

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.) CONTRACTOR AS PRINCIPAL SURETY						
Company:	(Corporate Seal)	Company:	(Corporate Seal)			
Signature: Name and Title: Address:		Signature: Name and Title: Address:				

$\mathbf{W} \mathbf{AIA}^{\circ}$ Document A232[°] – 2019

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

for the following PROJECT:

(Name, and location or address)

Tuckahoe Middle School/High School Reconstruction 65 Siwanoy Blvd. Eastchester, NY 10709 SED # 66-03-02-03-0-002-024

THE CONSTRUCTION MANAGER:

(Name, legal status, and address)

Calgi Construction Management 56 Lafayette Avenue, Ste. 350 White Plains, NY 10603 Telephone 914.682.9423

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

Tuckahoe Union Free School District 65 Siwanoy Blvd. Eastchester, NY 10709

THE ARCHITECT:

(Name, legal status, and address)

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

ADDITIONS AND DELETIONS:

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

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

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132[™]–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132[™]–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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ARTICLE_1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents. The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Constructor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

§ 1.1.3 The Work. The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

§ 1.1.7 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.8 The Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.9 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.10 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

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§ 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.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 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 retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203TM–2013, Building

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

§ 1.8 Building Information Models Use and Reliance

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

OWNER ARTICLE 2

§ 2.1 General

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

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work, and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

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§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements,

assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit.

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

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 2.3.5 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.6 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to review by the Construction Manager and prior approval of the Architect, and the Construction Manager or Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

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

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where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

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

§ 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 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner, the Construction Manager, and the Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

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§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 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 approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor 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

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

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

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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, assisted by the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be 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 14 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 that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may submit a Claim as provided in Article 15.

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

§ 3.8 Allowances

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

§ 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 notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager, or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

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§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager, and the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager, and Architect, and incorporated into the approved Project schedule.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, and Owner, and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data, and Samples

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§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

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

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Contract Documents. Submittals that are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract

Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Construction Manager and Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner, the Architect, and the Construction Manager shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.

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§ 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall 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.

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§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

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§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.

§ 4.1.3 Duties, responsibilities, and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Construction Manager, Architect, and Contractor. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be 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 and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

§ 4.2.6 Communications. The Owner shall communicate with the Contractor and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract Documents. The Owner and Construction Manager shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Construction Manager otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be

through the Construction Manager. Communications by and with the Owner's own forces and Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.11 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

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§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

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§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

§ 4.2.17 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Construction Manager of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.18 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of the Construction Manager, Owner, or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions so rendered in good faith.

§ 4.2.20 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

SUBCONTRACTORS ARTICLE 5

§ 5.1 Definitions

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

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

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

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Construction Manager, for review by the Owner, Construction Manager and Architect, of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor whether the Owner, the Construction Manager or the Architect (1) has reasonable objection to any such proposed person or entity or, (2) requires additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

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§ 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 for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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§ 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 .1 Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

§ 6.1.3 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner's own forces, Separate Contractors, Construction Manager and other Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or operations by the Owner or Separate Contractor's Work. The Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction. 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, Separate Contractors, or other Contractors.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor. A Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

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§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

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

- The change in the Work; .1
- .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:

- Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to .1 permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the 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 7.3.4 shall be limited to the following:

- Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, .1 workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect:
- Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or .2 consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner, Architect, Construction Manager, or an employee of any of them, or of the Owner's own forces, Separate Contractors, or other Contractors; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section

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15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts and the Architect, based on the recommendation of the Construction Manager, determines justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 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

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

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

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Construction Manager, before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Construction Manager and the Architect. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The Construction Manager shall forward to the Architect the Contractor's schedule of values. Any changes to the schedule of values shall be submitted to the Construction Manager and supported by such data to substantiate its accuracy as the Construction Manager and the Architect may require, and unless objected to by the Construction Manager or the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

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§ 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. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner, Construction Manager or Architect require, such as copies of requisitions, and releases of waivers of lien from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 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, suppliers, or other persons or entities that provided labor, materials and equipment relating to the Work.

§ 9.4 Certificates for Payment

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§ 9.4.1 Where there is only one Contractor, the Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

§ 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.2.1 Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

§ 9.4.3 The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality

or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor or other Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

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§ 9.6.1 After the Architect has issued a Certificate for Payment or Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor

fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner, Construction Manager nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

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

§ 9.8 Substantial Completion

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§ 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 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 of all of the Contractors, or designated portion thereof, is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute, a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

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

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly 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

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6), if required by the Owner, other data

establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be 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;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

§ 10.2 Safety of Persons and Property

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

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

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

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials

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

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

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

tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Construction Manager and Construction Manager's consultants, and the Architect and Architect's consultants, shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

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§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the

Contract Documents, the Owner shall inform both the Contractor and the Construction Manager, separately and in writing, prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice directly to the Contractor, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, sub-subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor, Architect, and Construction Manager for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to

requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Construction Manager, Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Construction Manager, Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK § 12.1 Uncovering of Work

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

§ 12.1.2 If a portion of the Work has been covered that the Construction Manager or Architect has not specifically requested to examine prior to its being covered, the Construction Manager or Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

§ 12.2.2 After Substantial Completion

§ 12.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, Construction Manager or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

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§ 12.2.3 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 of the Owner, Separate Contractors, or other Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Construction Manager, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

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

requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Construction Manager, Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.

§ 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

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

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and 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 reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Sub-subcontractor, or their agents or employees, or any other persons performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, after consultation with the Construction Manager, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 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 under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

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

§ 14.4 Termination by the Owner for Convenience

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§ 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 notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

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

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§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

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§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten 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 the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties, the Construction Manager, and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation

within 30 days of receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, 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 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

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§ 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. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.



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Section 007002

Insurance Rider (Supplement to Article 11 of Section 007000, AIA A232-2019 For Insurance Requirements for this Project)

Name of Insurance Producer:	
Name of Insured:	

The Contractor shall purchase and maintain during the life of the contract insurances as listed herein. This insurance must be purchased from a New York State licensed, A.M. Best Rated "A" or "A+" carrier. The Owner, the Architect, their Consultants and Subconsultants shall, with the exception of Worker's Compensation and Employer's Liability Insurance, be named as additional named insureds on a primary and non-contributory basis. Contractor must submit additional insured endorsements to the District for approval.

At least ten (10) working days prior to the commencement of the Work, the Contractor and all Subcontractors shall submit to the Owner, through the Architect, a Certificate of Insurance (AIA Form G705) or Accord 25-s showing evidence of insurance coverage as required by these documents. The standard Accord Form of Certificate of Insurance or insurance carrier certificate will be acceptable for employer's liability and statutory Disability. Submit all Workers' Compensation Certificates on form C-105.2, or if funded though the New York State Insurance Fund, on form U-26.3.

All Certificates of Insurance must be signed by a licensed agent or authorized representative of the insurance carrier.

The certificate shall be issued to the Owner with a provision that in the event the policies are either canceled or diminished, at least 30 days prior notice thereof shall be given to the Owner.

The insurance required for this project shall be written for not less than limits of liability specified in this attachment or otherwise within 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 date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

.1 General Liability: (Occurrence Form) – Limits Per Project using ISO Form CG 00 01 07 98 or later date

\$2,000,000	General Aggregate	
\$1,000,000	Products/Completed	
	Operations	
\$1,000,000	Personal and Adv. Injury	
\$1,000,000	Occurrence	
\$ 50,000	Fire Damage	
\$ 5,000	Medical Expense	

Coverage to include Broad Form Property Damage, Contractual Liability, Independent Contractors, and Personal Injury. No exclusion for XCU or hazards shall be endorsed to the Policy.

Products and Completed Operations Coverage to be kept in force for 12 months after final payment; a renewal certificate is to be submitted for the project if the coverage renews in less than 12 months following the completion of the project.

Coordinate requirements for additional insurance covering contractual obligations assumed by Contractor as established in Articles 3.18 and 10.3 of these Conditions by using Endorsement ISO Form B, CG2010 11/85 or CG 20 10 10/01 plus CG 20 37 10/01 or equivalent. This endorsement must also reflect that the coverage provided is Primary and Non-Contributory. Waiver of Subrogation applies to all policies for all additional insureds.

.2 Auto Liability to cover ALL autos; or Owned, Hired, Leased and Non-Owned Autos.

\$1,000,000	Combined Single Limit or
\$ 500,000	Bodily injury (per person)
\$1,000,000	Bodily injury (per accident)
\$ 500,000	Property Damage
\$ 5,000	Medical Payments

.3 Excess Liability: Insurance is to cover all stated insurance coverages listed within this Attachment

\$2,000,000	Each Occurrence
\$2,000,000	Aggregate
\$ 10,000	Retention (Maximum)

.4 Workers' Compensation

Statutory	Part A
Statutory	Disability
Employer's Liability	Part B
\$ 500,000	Each Accident
\$1,000,000	Disease Policy Limit
\$ 500,000	Disease Each Employee

.5 Hazardous Material Coverage

Hazardous material liability insurance as
follows:\$1,000,000 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 motor vehicles are used for transporting hazardous materials, the Contractor shall provide pollution liability broadened coverage (ISO endorsement CA 9948) as well as proof of M CS 90.

Coverage shall fulfill all requirements of the Contract and General Conditions and shall extend for a period of three (3) years following acceptance by the Owner of the Certificate of Completion.

.6 Testing Company Errors and Omission Insurance

\$1,000,000	Each Occurrence			
\$2,000,000	Aggregate			

for the testing and other professional acts of the Contractor performed under the contract with the Owner.

Further, Contractor shall require all Subcontractors to carry similar insurance coverages and limits of liability as set forth above and adjusted to the nature of Subcontractors' operations and submit same to Owner for approval prior to start of any Work.

Further, it is not the intention of these insurance requirements to require each Subcontractor, vendor or material man involved in the work to provide "excess" coverage in the amounts stated herein but the "excess" limit shall be at least 2 times the contract sum entered into between the individual Contractor and the particular Subcontractor, vendor or material man but not less than \$1,000,000.00, each occurrence, \$3,000,000 aggregate and \$10,000 retention (Maximum).

In the event 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 Owner, Architect, Engineers, Consultants and Subconsultants and their agents or employees 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.

The following shall be included as Additional Insureds

- School District (NAME), Members of the Board of Education, any officer, member of its staff, employee, or representative of school district.
- KG+D Architects and ALL consultants listed on the cover of the PROJECT/SPECIFICATIONS MANUAL

Proof o	Proof of Insurance shall show the following Insureds and Holder:				
(a)	Certificate Holder:				
(b)	Additional Named Insureds, on a primary basis:				
	Owner				
	Architect				
	Construction Manager (if applicable)				
	Consultants:				

SECTION 011000

DESCRIPTION OF WORK

1.01 GENERAL PROJECT DESCRIPTION

A. The scope of work of this project generally consists of the Reconstruction at Middle School/High School located at 65 Siwanoy Blvd, Eastchester, NY 10709 as depicted on the accompanying Contract Drawings and the Technical Specifications. The Work generally includes:

RENOVATION WORK

- Renovations to cafeteria, Library and Gym
- Asbestos abatement
- HVAC and electrical related improvements and related architectural work.
- B. Architect Identification: The Contract Documents were prepared for Project by Kaeyer, Garment + Davidson Architects, PC.
- C. Construction Manager: Calgi Construction Company has been engaged as Construction Manager for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and Contractor, according to a separate contract between Owner and Construction Manager.
- D. Bids shall be received in accordance with the New York State Public Bidding Laws; this project shall be executed under MULTIPLE PRIME CONTRACTS known as:

<u>Contract No. 1:</u> General Construction <u>Contract No. 2:</u> HVAC Construction <u>Contract No. 3:</u> Electrical Construction

Definitions as apply to "Contractors" involved with the work of this Project.

- 1. "The Contractor" or "Contractor" meaning that Respective Prime Contractor normally responsible for that work referenced;
- "Respective Prime Contractor" meaning either the Site, General, Plumbing, Mechanical or Electrical Contractors normally responsible for the referenced work;
- 3. "Trade Contractor" meaning that Respective Prime Contractor as above;

and such other terms relating to Contractors to be taken in context with respect to referenced work.

Further, wherein said Division 00 and 01 and respective Sections therein, any reference is made to "General Contractor", same shall be construed to mean "Contractor for the General Construction".

One set of Documents is issued covering all contracts. Each Prime Contractor shall review all drawings and specifications for complete understanding and knowledge of the Work

- E. Existing conditions are shown on the drawings to the best knowledge of the Architect. The Architect, however, cannot guarantee the correctness of the existing conditions shown and assumes no responsibility therefore. It shall be the responsibility of the Contractor to visit the site and verify all existing conditions.
- F. The Contractor's attention is directed to Articles 6.1.4 through 6.2.1.2 of Section 007000, which required coordination of this Contractor's work with the work and progress of other separate contracts.
- G. SECURITY PROVISIONS: Coordinate and comply with AIA 232-2019, General Conditions, and Section 011501 Special Project Requirements.
 - 1. All Contractors' employees shall use a single means of access and egress, except in the case of emergency, to be designated by the General Contractor.
 - 2. Each Contractor and each Subcontractor shall require his employees, while on the job site, to wear, in a conspicuous location, a Photo I.D. badge bearing the name of the individual and the Contractor for whom working. The badges of each Contractor shall be numbered consecutively. An up-to-date list of all I.D. badges, indicating the name and number along with a copy of the photograph for each employee, shall be furnished to the Owner.
- H. Regarding special inspections, the registered design professional in responsible charge shall be the Architect. The Owner shall hire the special inspectors and shall be responsible for the cost of special inspections but the contractor is responsible for the cost of any re-inspections or retesting. The inspections required are outlined on the Statement of Special Inspection and Tests Form included in Division 01. The Architect shall be responsible for determining the qualifications of the special inspectors, receiving and retaining all reports and assuring that any discrepancies are corrected. Special inspectors must keep records of inspections and furnish inspection reports to the Architect of record. The reports must indicate that the work inspected was done in conformance with the approved construction documents. Discrepancies must be brought to the attention of the contractor and non-corrected discrepancies must be brought to the attention of the Architect of record. A final report of inspections documenting required special inspections and correction of any discrepancies noted must be submitted to the registered design professional in responsible charge at the completion of the project. The design professional shall forward a copy of the final report to the school district for their records.
- I. SCOPE OF WORK SEPARATE PRIME CONTRACTS: Each Prime Contractor is responsible for all of Bidding and Contract Requirement, General Requirements (Division 1), and all work specifically indicated, including the following:
 - 1. General Construction Work: Structural and architectural drawings and Division 02 through 14, and civil and landscaping drawings and Division 31 through 33 except where specifically noted by others, and as specifically required to complete the work of the general construction
 - 2. HVAC Work: Plumbing drawings, HVAC drawings and Divisions 21, 22, and 23, and such work types, such as cutting and patching, firesafing, and access doors, as specifically required to complete the work of the plumbing and HVAC installations.

- 3. Electrical Work: Electrical drawings and Division 26, 27 and 28, and such work types, such as cutting and patching and firesafing / firestopping and access doors, as specifically required to complete the work of the electrical (and telecommunications) installations.
- J. All Prime Contractors are responsible to provide a complete installation of their work with the exception of such work that is specifically indicated to be by another Contractor. Exceptions or clarifications are as follows:
 - 1. Cutting and patching in the existing building generally will be by the trade needing that work. When mechanical or electrical work is above a ceiling, not being replaced by the GC, the Prime doing that work will be responsible for providing their own access and restoration. When the HVAC Contractor is making sanitary connections below grade at the existing, they will be responsible for accessing the existing pipe and restoration (subject to exceptions).
 - 2. Exceptions for cutting and patching at the existing building will be:
 - a. The GC will be responsible for penetrations through the existing façade and roof.
 - b. The GC will provide restoration of Floor Finish after HVAC Contractor or Electrical Contractor has restored floor for below grade sanitary and electrical conduit.
 - 3. All trades shall coordinate, schedule, and sequence work so no cutting and patching is required in new work (or the trade failing to comply would be responsible).
 - 4. Excavation for any sub grade mechanical / plumbing (within 5'-0" of the building) would be by the trade requiring same unless otherwise specifically noted on the Drawings. Outside of 5'-0", including any structures would be by the General Contractor, who would provide their own excavation.
 - 5. The EC may coordinate their conduit to be in the gravel layer under new slab on grade. They may run non-crossing conduit on the deck, perpendicular or parallel to column lines, provided conduit do not cross or otherwise impact on slabs over 1". Conduit that would cross, are larger than 1", or would otherwise impact slabs by more than 1, will be run by EC by other routes.
 - 6. Fire-safing / fire-stopping will be by the trade needing / installing that work.
 - 7. All trades to provide access doors as required by their work, to be installed by the GC.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Asbestos and lead paint awareness requirements.
- B. Construction time requirements and phasing if applicable
- C. Proof of orders and delivery dates
- D. Intent of Documents
- E. Field Measurements
- F. Initial Submittal Requirements
- G. Quality Requirements
- H. Testing and Inspection Laboratory Services
- I. Manufacturers Field Services and Reports
- J. Coordination.

- K. Field Engineering.
- L. Design Responsibility
- M. Schedules and Milestones
- N. Additional Requirements
- O. Mold Mitigation Requirements
- P. Waste Management
- Q. Use of Premises
- R. Owner Occupancy Requirements
- S. Payrolls and Payroll Records Coordinate with Sections 012900, 012901 and 017700

1.03 ASBESTOS AND LEAD PAINT AWARENESS REQUIREMENTS

- A. Contractor agrees not to use or permit the use of any asbestos containing material in or on any property belonging to the Owner.
- B. For purposes of this requirement, asbestos free shall mean free from all forms of asbestos including actinolite, amosite, anthrophyhllite, chrysotile, cricidolite and tremolite both in friable and non-friable states and without regard to the purposes for which such material is used.
- 1.04 CONSTRUCTION TIME AND PHASING REQUIREMENTS
 - A. The Contractor is advised the "time is of the essence" of the Contract as defined in Article 8 of the "Conditions". It is understood that the work is to be carried through to completion with the utmost speed consistent with good workmanship. Further, safe and legal ingress and egress shall be maintained at all times to and through the occupied portions of the construction site.
 - B. Work shall proceed in such a manner as to cause the least amount of disruption to the ongoing operations as possible. COORDINATE CLOSELY WITH SCHOOL OPERATING PERSONNEL.
 - C. All work and storage areas shall be completely enclosed by a fence or barricade at all times so that no student or the public can approach the area or the equipment. The Contractor shall maintain fences and barricades at all times and shall -
 - Provide signs posted on fence 50 feet on center that read "Work Area Keep Out".
 - [°] Maintain at all times, all exits and walkways from the Building.

Where the barricade is removed for work, the Contractor performing such work shall provide adequate safety personnel to prevent unauthorized persons from approaching the work area.

- 1. The Contractor is advised that areas of the existing buildings which are to be added to and/or altered under this Contract will remain in use during construction, coordinate with Section 015000 for temporary facilities.
- 2. Electrical and mechanical services to functioning spaces shall be maintained at all times.
- 3. The Contractor shall provide and maintain all required separations between old and new construction to prevent:
 - a. Entrance to construction areas by unauthorized individuals.
- D. CONSTRUCTION PHASING
 - 1. The phasing and/or milestone schedule included as Section 011100 has been established for the overall construction of the project.
 - 2. The Contractor is advised that areas of the existing buildings which are to be

added to and/or altered under this Contract will remain in use during construction, coordinate with Section 01 50 00 for temporary facilities.

- 3. Electrical and mechanical services to functioning spaces shall be maintained at all times. Swing-overs to new services shall be made so as to cause the least interruption to the facilities' operations. Limit utility shutdowns to two consecutive work days at no additional cost to the Owner unless prior agreement is made with the operating personnel of the facility.
- 4. The Contractor shall provide and maintain all required separations between old and new construction to prevent:
 - b. Entrance to construction areas by unauthorized individuals.
 - c. Heat loss from existing buildings.
 - d. Water (rain or ground water) infiltration into existing building.
- 1.05 PROOF OF ORDERS AND DELIVERY DATES Coordinate w/Sections 013300 and 013200.
 - A. Within 2 weeks after the approval of shop drawings, samples, product data and the like, the Contractor shall provide copies of purchase orders for all equipment and materials which are not available in local stock. The Contractor shall submit written statements from suppliers confirming the orders and stating promised delivery dates.
 - B. This information shall be incorporated within the progress schedules so required as part of Section 013200 and shall be monitored so as to insure compliance with promised dates.
- 1.06 INTENT OF DOCUMENTS See Article 1, Subparagraph 1.2.1 of Section 007000 for resolution of conflicts between drawings and specifications.

Regardless of hierarchy listed in reference paragraph, in cases of conflict as to the type or quality of materials to be supplied, the more restrictive shall govern.

- 1.07 FIELD MEASUREMENTS
 - A. Each Respective Contractor shall take all necessary field measurements prior to fabrication and installation of work and shall assume complete responsibility for accuracy of same.
 - B. This project is an ALTERATION and therefore necessitates additional attention to existing conditions receiving newly fabricated and installed equipment, i.e. note the requirements for field dimensioning of shop fabricated items whether or not so required by each technical section.
- 1.08 INITIAL SUBMITTAL REQUIREMENTS
 - A. As outlined in Sections 005000, 007000, 013300, 013200 and 015000 Contractor shall provide items noted including bonds, insurance, emergency telephone numbers, progress scheduling, schedules of submittals, subcontractor listings, and the like prior to the start of any work.
 - B. Schedule of Values
 - 1. Submit schedule on AIA Form G703.
 - 2. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement or as established in Notice to Proceed, whichever is earliest.

1.04 QUALITY REQUIREMENTS

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturer's instructions.
- C. Comply with specified standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- D. Monitor fabrication and installation tolerance control of installed Products over suppliers, manufacturers, Products, site conditions, and workmanship, to produce acceptable Work. Do not permit tolerances to accumulate.
- E. Comply fully with manufacturer's tolerances.
- 1.10 TESTING AND INSPECTION LABORATORY SERVICES Coordinate with Section 01 43 26
 - A. Owner will appoint, employ, and pay for specified services of independent firm to perform testing and inspection.
 - B. Independent firm will perform tests, inspections, and other services as required.
 - C. Cooperate with independent firm; furnish samples as requested.
 - D. Re-testing required because of non-conformance to specified requirements will be charged to Contractor.

1.05 MANUFACTURER'S FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, require material or Product suppliers or manufacturers to furnish qualified staff personnel to observe site conditions and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions that are supplemental or contrary to manufacturer's written instructions.
- 1.11 COORDINATION
 - A. Coordinate scheduling, submittals, and Work of various sections of specifications to ensure efficient and orderly sequence of installation of interdependent construction elements.
 - B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.
 - C. Coordinate space requirements and installation of mechanical and electrical work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable.
 - D. In finished areas, conceal pipes, ducts, and wiring within construction.
- 1.12 FIELD ENGINEERING Coordinate with Section 017123 of Division #1.
 - A. Contractor shall establish elevations, lines, and levels and certify elevations and locations of the Work conform with Contract Documents.
- 1.13 DESIGN RESPONSIBILITY Contractor is responsible for design of the following components of construction:
 - A. Engineered Metal Stud Framing at Learning Stairs per Section 05 40 00.
 - B. Other systems as specified
- 1.14 SCHEDULES
 - A. General

- 1. The objective of this project is to complete the overall work in the shortest period of time and to protect the building and occupants from damages caused by weather and construction activity during the progress of the work.
- 2. To meet these objectives, the Contractor shall plan the work, obtain materials, and execute the construction on the most expeditious manner possible in accordance with the requirements listed below.
- 3. If the Contractor fails to expedite and pursue any part of the work, the Owner may terminate the contract as per Article 14.2 or may carry out the work as per Article 2.4 of the General Conditions.
- 4. The Contractor shall work in coordination with work of other Contractors and with School activities with special attention to noise, dust, safety and other contract requirements for work in and around the occupied building.
- B. Work Period and Milestones– refer to the Milestone Schedule comprising Section 011100.

1.16 ADDITIONAL REQUIREMENTS

- A. If it appears that some of the work cannot be completed by the scheduled date, the Contractor shall increase the work force or increase the hours of work, including evenings and weekends or necessary, at no additional cost to the Owner. If the work is complete but the area is not cleaned and debris or equipment is not removed, the Owner shall have the right to prepare the area for occupancy with his own forces and deduct the costs from the Contract Amount.
- B. If the Contractor fails to staff the job adequately to meet the completion date, the Owner reserves the right to assume possession of the material and complete installation with the Owner's forces or other Contractors or to require the Contractor to work evenings and weekends.
- C. The school can be made available on weekends and evenings to allow the Contractor adequate time to complete the work before final completion date. Any custodial cost resulting in this after hours scheduling will be the Contractor's responsibility.
- D. In addition to the above-stated requirements for phasing of the work, the Contractors shall not do any noisy work in the areas where examinations will be conducted as per the published school calendar.
- E. The Contractor is responsible for temporary protection of all work until acceptance.
- F. The school will be closed on Saturdays, Sundays, regularly scheduled district holidays and school vacations, and at night after cleaning crews have finished. . If any Contractor wishes to work at any time when the school is normally closed, that Contractor must receive prior approval by the Owner and also shall arrange and pay for custodial services for the building at the applicable district pay rates. <u>All work taking place within the schools/buildings/grounds on weekends, holidays and school vacations must be approved in advance by the Owner.</u>
- G. To assist the Contractor in scheduling work, the following is a listing of the school's schedule from the date bids are received through the length of the work.

Refer to the Milestone Schedule comprising Section 011100 milestones and working schedule.

Refer to the Construction Implementation Plan comprising Section 011001 for hours of work on the site and scheduling restrictions due to school occupancy and continuing use of the building.

The school district's academic calendar listing school holidays and vacation days

https://echalk-slateprod.s3.amazonaws.com/private/districts/450/resources/ae7a44e8-e533-424c-9d30-6626ffcbb7a2?AWSAccessKeyId=AKIAJSZKIBPXGFLSZTYQ&Expires=19629936 09&response-cache-control=private%2C%20max-age%3D31536000&responsecontent-disposition=%3Bfilename%3D%222021-22_Calendar%2520%25201.pdf%22&response-contenttype=application%2Fpdf&Signature=hNkH%2F5yp3SGMEvWSmrK6J5X%2B9Ho %3D

- 1.17 MOLD MITIGATION REQUIREMENTS (As applicable to Project Construction)
 - A. All return air ductwork and all exhaust air ductwork be sealed tight with mastic.
 - B. Do not allow open plenum returns above dropped ceilings unless the plenum is sealed tightly with respect to the exterior walls and roof.
 - C. The buildings HVAC system shall not be operated during construction.
 - D. All gypsum wallboard be installed with a fire sealant bead of 3/8 in. (9 mm) between the floor and the bottom edge of the gypsum.
 - E. The moisture content (or water vapor emission rate) of all concrete block walls be measured and documented by the general contractor, and that no gypsum board be hung on those walls until the moisture content of the blocks in the wall measures the same as the identical type of block that has been stored away from any rain exposure.
 - F. The moisture content of the taped and sanded gypsum board walls be measured and documented by the general contractor at two locations on each wall: the bottom edge and halfway between floor and ceiling. Interior finish may not be applied until the moisture content of the wallboard is below 0.4% on a gypsum moisture meter or below 12% on a wood meter, coordinate with Division 9 sections as applicable.
 - G. The moisture content of the concrete floor slab shall be measured as soon as the building has been closed in and as soon as the slab temperature can be brought within the 65°F to 75°F (18.3°C to 23.9°C) temperature required for the measurement. If the moisture content is excessive, the air above the concrete shall be held below 30% relative humidity until the material is dry enough to meet the specification established by the respective flooring manufacturers, coordinate with Division 9 sections as applicable.

1.18 WASTE MANAGEMENT PROCEDURES AND DEFINITIONS

- A. Waste Management Coordination: Coordinate recycling of materials with Owner and as required to conform to the Construction Waste Management Plan defined in Section 017419.
- B. Contractor shall conduct Construction Waste Management meetings as outlined in Section 013119 Project Meetings. At a minimum, waste management goals and issues shall be discussed at the following meetings:
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.
 - 4. Job safety meetings.

- C. Use on-site waste as primers, sealers, underlayments, supports, backing, blocking, furring, suspension systems, and accessories as required for any purpose in patching work damaged as a result of construction activities.
- D. Waste Management Definitions
 - 1. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
 - 2. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
 - 3. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitability, corrosivity, toxicity or reactivity.
 - 4. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitability, corrosivity, toxicity, or reactivity.
 - 5. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
 - 6. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
 - 7. Recycle: To remove a waste material from the Project site to another site for remanufacture into a new product for reuse by others.
 - 8. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
 - 9. Return: To give back reusable items or unused products to vendors for credit.
 - 10. Reuse: To reuse a construction waste material in some manner on the Project site.
 - 11. Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.
 - 12. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
 - 13. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
 - 14. Toxic: Poisonous to humans either immediately or after a long period of exposure.
 - 15. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
 - 16. Volatile Organic Compounds (VOCs): Chemical compounds common in and emitted by many building products over time through outgassing including solvents in paints and other coatings; wood preservatives; strippers and household cleaners; adhesives in particleboard, fiberboard, and some plywoods; and foam insulation.
 - 17. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
 - 18. Waste Management Plan: A Project-related plan for the collection, transportation, and disposal of the waste generated at the construction site. The purpose of the plan is to ultimately reduce the amount of material being landfilled.

1.19 USE OF PREMISES

- A. Use of Buildings and Sites:
 - 1. Limits: Confine constructions operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated. All areas of the site with the exception of the project area where the Work is being performed are off limits to Contractor and his employees
 - 2. Owner Occupancy: Allow for Owner occupancy of the buildings and sites and use by the public. Conduct the Work to provide the least possible interference to the activities of the Owner's personnel and use of the buildings and sites by the public
 - 3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, the public and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - c. Coordinate staging, parking and storage areas with the Construction Manager.
 - d. Refer to the Construction Implementation Plan for additional requirements
 - 4. Damages: Promptly repair damages caused to adjacent facilities by work of the Contract to a good-as-new condition acceptable to the Owner.
 - 5. Existing Facilities: The following facilities are specifically noted as **not** to be used by Contractor or his employees:
 - a. Toilet facilities.
 - b. Food service facilities, including kitchen and dining areas.
 - c. Telephones.
 - 6. Utility Shutdowns: Coordinate all utility shut downs and cross overs with the Construction Manager, schedule during off hours and non-occupied times only.

1.20 OWNER OCCUPANCY REQUIREMENTS

- A. Owner will occupy site and existing buildings during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Occupancy level will be reduced during summer months when school is not in session. Coordinate with Construction Manager for schedule of working hours and work restrictions during period when school is in session.
- B. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will provide, operate, and maintain mechanical and electrical systems serving occupied portions of building. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building and site.
- C. Comply with standards for construction projects as follows:

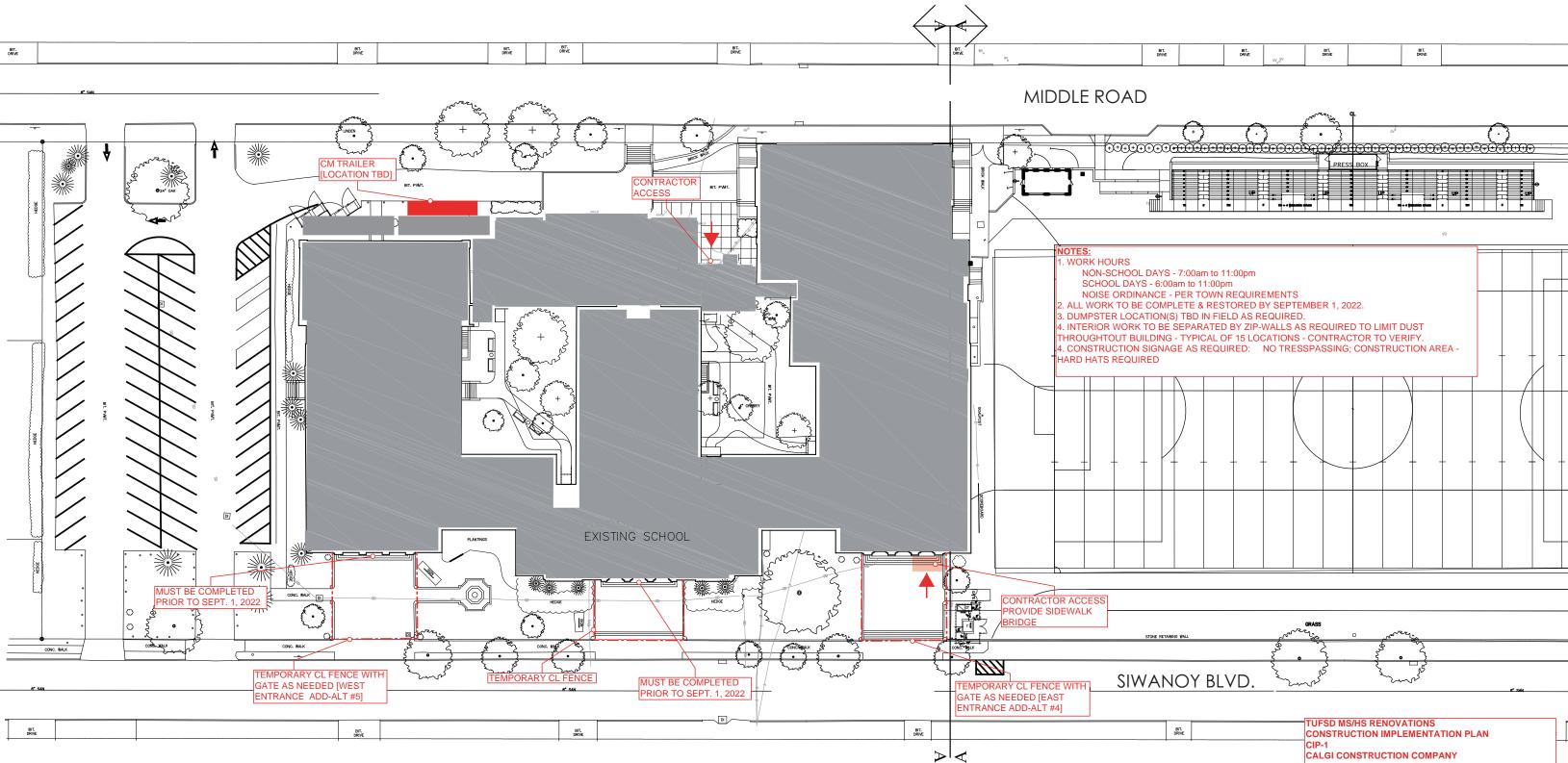
- 1. Interaction with employees and the public is strictly forbidden.
- 2. Use of offensive or inappropriate language is strictly forbidden.
- 3. The use of radios, tape and CD players is prohibited on the site and in the buildings.
- 4. Smoking is prohibited on the site and in the buildings.
- 1.21 PAYROLLS AND PAYROLL RECORDS See Section 012900 and 012901
 - A. In accordance with Article 8, Section 220 of the New York State Labor Law and applicable Article in the General Conditions, every contractor and subcontractor must keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. Payrolls must be maintained for at least three years from the project's date of completion. At a minimum, payrolls must show the following information for each person employed on a public work project:
 - 1. Name
 - 2. Classification(s) in which the worker was employed
 - 3. Hourly wage rate(s) paid
 - 4. Supplements paid or provided
 - 5. Daily and weekly number of hours worked in each classification.
 - B. Every contractor and subcontractor shall submit, 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.

End of Section

CONSTRUCTION IMPLEMENTATION PLAN

1.1 GENERAL

A. See the following page for the Construction Implementation Plan for this project.



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MILESTONE SCHEDULE

- 1.1 GENERAL
 - A. See the following page for the Construction Milestone Schedule for this project.

Calgi Construction Company Inc. calgiconstruction.com

2021 CAPITAL PROJECT PRELIMINARY MILESTONE SCHEDULE Dated April 1, 2022

	<u></u>			Deve		-	
Act ID	Responsibility	Description	Orig Dur	Rem Dur	Early Start	Early Finish	2022 MAR APR MAY JUN JUL AUG SEP OCT
Start							
			0			01APR22	
1000		Project Start	0	0	01APR22		Project Start
Pre-Cor	nstruction P	hase					
			44d			01JUN22	
1015	TEAM	Bidding Phase	20d			28APR22	Bidding Phase
1020	TEAM	Pre-Bid Meeting	1d			07APR22 28APR22	Pre-Bid Meeting
1030 1062	TEAM TEAM	Bids Due/Opening Bid Analysis & Recommendation GC & MEP	1d 10d			11MAY22	Bid Analysis & Recommendation GC & MEP Contracts
1063	TEAM	Interview Contractors - GC & MEP Contracts	5d			06MAY22	► Interview Contractors - GC & MEP Contracts
1065	TUFSD	BOE Approved & Award GC & MEP Contracts	1d			17MAY22	BOE Approved & Award GC & MEP Contracts
1072	CCC	Bonds, Insurance & Contracts - GC & MEP	10d		18MAY22		Bonds, Insurance & Contracts - GC & MEP Contract
1080	CCC	RFP for Air Monitoring & Testing Services	10d			01JUN22	► ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
1090		Completion of Bidding Phase	0	0		01JUN22	Completion of Bidding Phase
Constru	uction Start						
			51d			10AUG22	
1095	CCC ALL	Notice to Proceed - GC & MEP Contracts	1d		02JUN22 02JUN22		Notice to Proceed - GC & MEP Contracts Pre Construction Meeting - GC & MEP Contracts
1102 1106	PRIME	Pre Construction Meeting - GC & MEP Contracts Master Construction Schedule GC & MEP	1d 15d		02JUN22 03JUN22		Master Construction Schedule GC & MEP Contracts
1112	PRIME	Submittals Approval - GC & MEP Contracts	30d		03JUN22		Submittals Approval - GC & MEP Contracts
1117	PRIME	Material & Eq. Procurement - GC & MEP Contracts	45d			10AUG22	Material & Eq. Procurement - GC & MEF
1122	PRIME	Contractor Mobilization - GC & MEP	5d		27JUN22		Contractor Mobilization - GC & MEP
1125	GC	Abatement - DOL 10 Day Notice - Gymnasium Floor	10d		15JUN22		Abatement - DOL 10 Day Notice - Gymnasium Floor
1128	PRIME	Temp. Services + Protection - GC & MEP Contracts	5d	5d	27JUN22	01JUL22	Temp. Services + Protection - GC & MEP Contracts
wildale/	High - Gene	rai Contract	400.1	400.1		0005000	
			126d			23DEC22	Demolities (Absternet
1140 1150	PRIME	Demolition/Abatement Building Alterations - Library & Cafeteria	15d 86d		27JUN22	18JUL22 26OCT22	
1160	PRIME	Classrooms, Corridors, Doors & Hardware	35d			15AUG22	Classrooms, Corridors, Doors & Hard
1170	PRIME	Punchlist - Classrooms, Corridors, Doors & Hdwr.	15d			06SEP22	Punchlist - Classrooms, (
1175	PRIME	Substantial Completion	1d			26OCT22	i
1180	PRIME	Punchlist Completion	10d			09NOV22	i.
1190	PRIME	Closeout Documents	10d			23NOV22	
1200	PRIME	Final Payments	20d			23DEC22	
1270 Middle/	High - HVAC	Completion of Building Contract	0	0		23DEC22	
winduie/	PRIME	Contract	126d	1264	27 II IN 22	23DEC22	
1335	PRIME	HVAC Alterations - Library & Cafeteria	86d			260CT22	
1336	PRIME	Classrooms & Corridors	35d			15AUG22	Classrooms & Corridors
1338	PRIME	Punchlist - Classrooms & Corridors	15d			06SEP22	Punchlist - Classrooms 8
1340	PRIME	Substantial Completion	1d			26OCT22	
1350	PRIME	Punchlist Completion	10d			09NOV22	
1370	PRIME	Closeout Documents	10d			23NOV22	
1380	PRIME	Final Payments Completion of HVAC Contracts	20d	20d 0		23DEC22 23DEC22	
1390 Middle/	PRIME	rical Contract	0	0		Z3DEC22	
winduie/	PRIME		1264	1264		23DEC22	
1410	PRIME	Electrical Alterations	126d			23DEC22 26OCT22	
1410 1416	PRIME	Classrooms, Corridors & Fire Alarm System	86d 35d			15AUG22	Classrooms, Corridors & Fire Alarm S
1418	PRIME	Punchlist - Classrooms, Corridors & Fire Alarm	15d			06SEP22	Punchlist - Classrooms,
1420	PRIME	Substantial Completion	1d			260CT22	
1430	PRIME	Punchlist Completion	10d	10d	270CT22	09NOV22	
1440	PRIME	Closeout Documents	10d			23NOV22	
1450	PRIME	Final Payments	20d			23DEC22	
1460 Start date	01APR22	Completion of Electrical Contract	0	0		23DEC22	
Finish date	23DEC22						Tuckahoe Union Free School District
Data date Run date	01APR22 30MAR22	-					
Page numb	per 1A	-					Middle/High School
	era Systems, Inc.	-					-

KG&D Architects, P.C. kgdarchitects.com

ОСТ	NOV	DEC	JAN	2023 FEB	MAR
IEP Contracts	8				
Buildin	g Alterations -	Library & Cafet	eria		
lardware	D				
	Doors & Hdwr. antial Completio				
	Punchlist Cor				
-		eout Documents			
			al Payments		
		→ Co	mpletion of Build	ding Contract	
Η\/ΔC	Alterations - Li	ibrary & Cafeter	ia		
		and y a Carolo			
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Substa	antial Completio				
	Punchlist Cor	mpletion eout Documents			
•			al Payments		
			mpletion of HVA	C Contracts	
	cal Alterations				
m System ns, Corridors &	& Fire Alarm				
	antial Completion	on			
	Punchlist Cor	mpletion			
9	Close	eout Documents			
			al Payments	trical Contract	
		- 0 C0	mpletion of Elec	Etrical Contract	
				Progress	
				Critical b	

SECTION 011501 - SPECIAL PROJECT REQUIREMENTS

Excerpts from 8 NYCRR Section 155.5 as they address "General Safety and Security Standards for Construction Projects".

STATEMENT OF PURPOSE: "The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a certificate of occupancy"

- 1.01 GENERAL
 - A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
 - B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
 - C. All contractors, subcontractors, Sub-subcontractors, vendors and the like shall monitor their workers and require that they adhere to the following safety provisions during all construction and maintenance activities for the duration of the project.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION AS APPLICABLE TO THE PARTICULAR PROJECT SCOPE OF WORK

- A. Safe and Secure Storage of Construction Materials
- B. Fencing Project; Material storage areas; Container/Refuse areas
- C. Gates Manned during working hours; locked and secure off hours.
- D. Sidewalk bridges, security barriers, etc. reference "Exterior Renovations"
- E. Worker identification system
- F. Temporary partitions separation of construction areas from occupied spaces; construction, materials, inspection and maintenance.
- G. Worker access both horizontal and vertical in occupied buildings
- H. Debris removal.
- I. Ventilation of work spaces
- J. Exiting
- K. Fire and hazard prevention
- L. No Smoking
- M. Fire extinguishers
- N. Temporary sprinklers (if any)
- O. Smoke detectors (temporary)
- P. Fire watch and maintenance of existing fire alarm systems
- Q. Storage of gas and welding equipment
- R. Noise abatement procedures
- S. Construction fume controls
- T. Off-Gassing/bake out procedures
- U. Material Safety Data Sheet log
- V. Asbestos Code Rule 56
- W. Asbestos TEM
- X. Lead Abatement/Lead paint
- Y. Indoor Air Quality

- 1.03 SAFE AND SECURE STORAGE OF CONSTRUCTION MATERIALS Coordinate with Sections 01 50 00 and 01 61 00 each as included with these documents.
 - A. Materials stored on the Site shall be neatly arranged and protected, and shall be stored in an orderly fashion in locations that shall not interfere with the progress of the Work.

<u>NOTE</u>: If approval is given to store materials in any part of the building area, they shall be so stored as to cause no overloading of the structure.

- 1.04 FENCING PROJECT; MATERIAL STORAGE AREAS; CONTAINER/REFUSE AREAS – Coordinate with Section 01 50 00
 - A. Barrier fencing constructed as outlined in Section 01 50 00 shall be provided surrounding all work areas, material storage locations and around dumpsters and/or chutes when involved with demolition/removal operations.
 - B. Fencing shall be maintained in good sound condition throughout the entire course of construction by the Owner's Representative and/or Contractor and removed only when directed by the Architect and/or Owner's Representative.
- 1.05 GATES
 - A. Gates in construction fencing shall be of construction outlined in Section 01 50 00 and shall be under either the Owner's Representative or Contractors' supervision throughout the work day and shall be secured in a locked condition at the close of any single business day and on all non work days. Gates shall be manned at all times work is in progress.
- 1.06 SIDEWALK BRIDGES, SECURITY BARRIERS, ETC. REFERENCE "EXTERIOR RENOVATIONS"
 - A. As applicable to the project involved, provide overhead protective devices for the work consisting of tubular framed scaffold bridges, joist trusses and solid decking. Provide guard rails, lights and warning signs.
- 1.07 WORKER IDENTIFICATION SYSTEM Coordinate with Section 01 10 00, Article 1.01.
 - A. All Contractors' employees shall use a single means of access and egress, except in the case of emergency, to be designated by the General Contractor.
 - B. The Contractor shall, for all work covered under the Contract, establish a security control system for personnel and material involved with the work herein.
 - C. The control system shall include photo identification badges and the like so as to insure against unauthorized entry to the site and resultant entry to the building proper.
- 1.08 TEMPORARY PARTITIONS SEPARATION OF CONSTRUCTION AREAS FROM OCCUPIED SPACES; CONSTRUCTION, MATERIALS, INSPECTION AND MAINTENANCE Coordinate with Section 01 50 00 as applicable to project type.
 - A. Provide temporary partitions from floors to underside of structure above, in sash and any other openings created by new construction, additions and alterations.
 - B. Such partitions shall be constructed dust-tight using steel studs and acoustically and/or thermally insulated, Level 1 taped fire rated gypsum board as specified in Section 09 29 00.
 - C. Locate enclosures as directed by the Architect and/or as shown on the drawings.

- D. In addition to partitions and closures, provide tight fitting filters over all return air grilles and/or open ducts in order to properly protect central air handling equipment.
- E. <u>Take all necessary precautions to avoid unnecessary dust spreading to adjoining</u> rooms and spaces.
- F. Keep all doors to spaces closed and provide positive seals around cracks, frames, doors and other openings within work areas.
- G. WHERE EXTERIOR CLOSURES ARE REQUIRED, INSULATE SAME TO MAINTAIN A TEMPERATURE OF SIXTY-FIVE (65) DEGREES F. WITHIN THE PLANT WITHOUT THE USE OF SPECIAL HEATING EQUIPMENT.
- H. All temporary enclosures/partitions/containment barriers shall be periodically inspected and maintained in good repair so as to prevent exposure to dust and contaminants outside the work and/or containment areas.
- 1.09 WORKER ACCESS BOTH HORIZONTAL AND VERTICAL IN OCCUPIED BUILDINGS
 - A. A specific stairwell and/or elevator shall be assigned for construction worker use during work hours. Workers may not use corridors, stairs or elevators designated for students or school staff.
- 1.10 DEBRIS REMOVAL Coordinate with Sections 01 50 00, 01 77 00 and 02 41 19/20.
 - A. Large amounts of debris must be removed by use of enclosed chutes or similar systems. There shall be no movement of debris through corridors of occupied spaces of the building. No materials shall be dropped or thrown outside the walls of the building.
 - B. All occupied parts of the building or buildings affected by renovation activity shall be cleaned at the close of each work day.
 - C. School buildings occupied during any construction period shall maintain required health, safety and educational capabilities at all times that classes are in session.
- 1.11 VENTILATION OF WORK SPACES
 - A. The General Contractor shall provide indoor air quality management as follows:
 - 1. Provide at exhaust air system for the project indoor areas which could produce fumes, VOC's off-gasses, gasses, dusts, mists, or other emissions both during construction activities **and** during required curing periods, coordinate with manufacturer's requirements for all materials used.
 - 2. Exhaust air system for the project areas which could produce emissions listed in Paragraph 1 shall be utilized. Work area exhaust shall terminate at the building exterior.
 - 3. Provide temporary partitions and air seals to prevent the migration of airborne contaminants from unoccupied areas to occupied areas when applicable.
 - 4. Quality assurance:
 - a. Maintain a negative pressure between the work area and the space surrounding the work area.
 - b. Before start of work, submit a design for the exhaust air system. Do not begin work until approval of the Construction Manager is obtained. The design shall include, but not be limited to:
 - 1. The number of machine required.
 - 2. Location of the machines in the work space.

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- 3. Description of the methods used to test air flow and pressure differential.
- 5. System operation:
 - a. A sufficient quantity of exhaust fans in existing window openings or other approved locations shall be operated in accordance with the following standards:

Provide one work place air change every 15 minutes.

To calculate total air flow requirements:

TOTAL FT/3MIN – VOLUME OF WORK AREA (IN FT3) 15 MINUTES

To calculate the number of units needed for the work area.

NUMBER OF UNITS NEEDED – TOTAL FT3/MIN (CAPACITY OF UNIT IN FT3/MIN)

- b. Exhaust air system shall operate for a minimum of 72 hours after work is completed, or until all materials have cured sufficiently as to stop out gassing of fumes or odors and area has been ventilated to remove all detectable traces of odors and fumes.
- c. Maintain 25 feet clearance from all temporary exhaust outlets to all active building outdoor air intakes.
- 6. During reroofing operations, roof patching and new HVAC installations on the existing roof, air intakes shall be "shut-down" or made safe in other approved manners.
- B. The HVAC Specialty Contractor is to be completely responsible for maintaining all required ventilation in the occupied areas of the building during construction as follows:
 - 1. Prior to construction, the HVAC Specialty contractor will examine the existing ductwork in the occupied areas of the building.
 - 2. The layout of existing ductwork is shown, to the extent that it was originally documented, on the HVAC drawings.
 - 3. The HVAC Specialty contractor will reroute, disconnect or cap nay duct, which because of its proximity to the construction area, may carry contaminants from the construction area to the occupied area.
 - 4. This alteration of the existing ventilation system must prevent contaminants from entering the occupied areas, but must not prevent the maintenance of necessary ventilation in the occupied area.

Additionally, as the HVAC Specialty contractor provides and connects new ductwork it will continue to evaluate the effect of such ducts and connections on contaminant migration. It will reroute, disconnect or cap this ductwork as needed to prevent contaminants from the construction area from entering the occupied section of the building.

At each point in the construction where such evaluation and rerouting, disconnecting or capping is required, the HVAC Specialty contractor will confer with the Architect and Construction Manager (as appropriate) in determining its course of action and will obtain the Architect's approval prior to executing this work."

- 1.12 EXITING
 - A. At all times, the General Contractor is responsible for maintenance of safety and egress requirements from work areas.

NOTE: All legal forms of egress must be maintained at all times.

- B. Provide temporary exit passage system(s) with guard and hand rails and ramps and such other measures indicated on the drawings and as specified.
- 1.13 FIRE AND HAZARD PREVENTION See Section 01 50 00 for requirements for fire watches, storage and maintenance of welding gasses and temporary heating and the like.
- 1.14 NO SMOKING No smoking is permitted on the grounds or within the construction area of any project.
- 1.15 FIRE EXTINGUISHERS Fire extinguishers shall be provided within the work area and shall be monitored on a scheduled maintenance basis and so tagged to indicate same.
- 1.16 TEMPORARY SPRINKLERS (IF ANY) See Section 01 50 00 for applicable text and requirements.
- 1.17 SMOKE DETECTORS The Electrical contractor shall provide a temporary battery powered smoke detection system for all areas under construction.
- 1.18 FIRE WATCH AND MAINTENANCE OF EXISTING FIRE ALARM SYSTEMS See Sections 01 35 16 and 01 50 00
 - A. All Contractors shall comply with the safety provisions of the National Fire Protection Association's "National Fire Codes" pertaining to the work and, particularly, in connection with any cutting or welding performed as part of the work.
 - B. During welding or cutting operations, a contractor's man shall act as a fire watcher. The fire watcher shall have proper eye protection and suitable fire fighting equipment including fire extinguisher (bearing current inspection Certificate), protective gloves and any other equipment deemed necessary.
 - C. The Electrical Specialty Contractor will provide for and maintain the proper operation of fire alarm and smoke detection systems in all areas throughout the course of the project. The Electrical Specialty Contractor will provide all labor and material required to accomplish this in occupied areas of the school buildings and in areas under construction.
- 1.19 STORAGE OF GAS AND WELDING EQUIPMENT See Section 01 50 00 for specific requirements and controls.
- 1.20 NOISE ABATEMENT PROCEDURES

- A. Develop and maintain a noise abatement program and enforce strict discipline over all personnel to keep noise to a minimum. Equipment and work shall not produce noise in excess of 60db in occupied areas or shall be scheduled for off hours or acoustical abatement procedures shall be taken. Noise level measurements (dba) shall be taken with a type 2 sound level meter in the occupied space in a location closest to the source of the noise.
- B. Execute construction work by methods and by use of equipment which will reduce excess noise.
- C. Equip air compressors with silencers, and power equipment with mufflers.
- D. As established in Section 01 10 00, all contractors shall abide by the "no work" periods designated by the Owner.
- 1.21 CONSTRUCTION FUME CONTROLS See Article 1.11 herein.
- 1.22 OFF-GASSING/BAKE OUT PROCEDURES See Section 01 77 00
 - A. Heat all areas of new construction to 95 degrees for a minimum of 72 hours.
 - B. At the end of this period ventilate area with 100 percent outside air and exhaust air for a minimum of 24 hours to eliminate off gassing that occurs during bake out period.
 - C. Change all air filters upon completion.
 - D. Manufacturers shall be contacted to obtain information regarding appropriate temperatures and times needed to cure or ventilate the product during use and before safe occupancy of a space can be assured. Building materials or furnishings which "off-gas" chemical fumes, gases, or other contaminants shall be aired out in well-ventilated heated warehouse before they are brought to the project for installation or the manufacturer's recommended "off-gassing" periods must be scheduled between installation and use of the space. If the work will generate toxic gases that cannot be contained in an isolated area, the work must be done when school classes and programs are not in session. The building must be properly ventilated and the material must be given proper time to cure or "off-gas" before re-occupancy.
- 1.23 MATERIAL SAFETY DATA SHEET LOG Coordinate with Section 01 33 00
 - A. Contractor shall maintain "MSDS" file on site, accessible to workers and otherwise in compliance with jurisdiction's "Right To Know" legislation.
 - B. The submittal of the required MSDS information shall be segregated from the required material/shop drawing/sample submittals in a separate binder and not comingled with the technical submittals, failure to so conform will be cause for rejection of any submittal.
- 1.24 ASBESTOS CODE RULE 56 AND ASBESTOS CONTAMINATED MATERIALS (ACM)
 - A. Abatement projects as defined by Rule 56 shall not be performed while the building is occupied.
 - B. In the event asbestos-contaminated materials are encountered during the work Contractor shall immediately notify the Architect and/or Owner for instructions as to procedures to be taken.
 - C. All asbestos abatement projects shall comply with all applicable federal and State laws including but not limited to the New York State Department of Labor industrial code rule 56(12 NYCRR 56), and the federal Asbestos Hazard Emergency

Response Act (AHERA), 40 CFR Part 763 (Code of Federal Regulations, 1998 Edition, Superintendent of Public Documents, 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, New York 12234). Large and small asbestos projects as defined by 12 NYCRR 56 shall not be performed while the building is occupied. Minor asbestos projects defined by 12 NYCRR 56 as an asbestos project involving the removal, disturbance, repair, encapsulation, enclosure or handling of 10 square feet or less of asbestos or asbestos material, or 25 linear feet or less of asbestos or asbestos material may be performed in unoccupied areas of an occupied building in accordance with the above referenced regulations.

- 1.25 LEAD ABATEMENT/LEAD PAINT
 - A. In the event lead based paint is encountered during the work Contractor shall immediately notify the Architect and/or Owner for instructions as to procedures to be taken.
 - B. Attention is directed to technical Section 09 90 00 for "protocols" concerning lead paint removals and preparation.
 - C. Any construction or maintenance operations which will disturb lead based paint shall be abated pursuant to protocols detailed in the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" (June 1995; U.S. Department of Housing and Urban Development, Washington, DC 20410; available at the Office of Facilities Planning, Education Building Annex, Room 1060, State Education Department, Albany, NY 12234). All areas scheduled for construction as well as areas of flaking and peeling paint shall be tested for the presence of lead and abated or encapsulated in accordance with the above noted guidelines

End of Section

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

- PART 3 EXECUTION
- 3.1 SCHEDULE OF ALTERNATES
 - A. Alternate #1 (ADD ALTERNATE) State the amount to be added to the Base Bid for the provision of HVAC DOAS UNITS #3, 4, & 5, related ACCU units 2, 3, 6, 7 & 8 and related indoor heat pumps, refrigerant and condensate piping, ductwork and accessories, registers, power, fire alarm and controls & any & all demolition & patching coordinate with all MEP drawings
 - 1. Contracts Affected:
 - a. 1 General Construction
 - b. 2-HVAC
 - c. 3 Electrical
 - B. Alternate #2: State the amount to be added to the Base Bid for the provision of HVAC DOAS UNITS #,1 & 2, related ACCU units 1, 4 & 5 and all related indoor heat pump units, refrigerant and condensate piping, ductwork and accessories, registers, power, fire alarm and controls, etc. & any & all demolition & patching coordinate w/ all MEP drawings
 - 1. Contracts Affected:
 - a. 1 General Construction
 - b. 2 HVAC
 - c. 3 Electrical
 - C. Alternate #3: State the amount to be added to the Base Bid for removal and replacement of the existing gymnasium hardwood flooring system, temporary removal, storage, and reinstallation of existing wood bleacher system, and temporary removal, storage and reinstallation of existing ceiling hung divider curtains
 - 1. Contracts Affected:
 - a. 1 General Construction
 - D. Alternate #4: State the amount to be added to the Base Bid for work related to cleaning, repointing & restoration of existing cast stone lintels and repair and/or replacement of the existing steel lintels of TUFSD HS EAST entrance as shown on 1/A302 & related photographs
 - 1. Contracts Affected:
 - a. 1 General Construction
 - E. Alternate #5: State the amount to be added to the Base Bid for work related to cleaning, repointing & restoration of exist cast stone lintels and repair and/or replacement of the existing steel lintels of TUFSD HS WEST entrance as shown on 2/A302 & related photographs

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- 1. Contracts Affected:
 - a. 1 General Construction

END OF SECTION 012300

SECTION 012500

PRODUCT OPTIONS AND SUBSTITUTIONS

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Approved Equal Clause
- B. Substitution Requests
- C. Options
- D. Contractor's Representation
- E. Reimbursements

1.03 APPROVED EQUAL CLAUSE

- A. Throughout the Specifications, types of material may be specified by manufacturer's name and catalog number in order to establish standards of quality and performance and not for the purpose of limiting competition. Inclusion by name, of more than one manufacturer or fabricator, does NOT necessarily imply acceptability of standard products of those named. All manufacturers, named or proposed, shall conform, with modification as necessary, to criteria established by Contract Documents for performance, efficiency, materials and special accessories.
- B. Contractor may assume the phrase "or approved equal" except that the burden is upon the Contractor to prove such equality and to satisfy Architect that proposed substitute is equal to, or superior to, the item specified.

1.04 SUBSTITUTION REQUESTS

- A. If the Contractor elects to prove such equality, he must request the Architect's and the Owner's approval in writing for substitution of such items for the specified items, stating the differences involved with and submitting supporting data and samples, if required, to permit a fair evaluation of the proposed substitution with respect to -
 - 1. Performance;
 - 2. Delivery times and effect on schedules, if any;
 - 3. Safety;
 - 4. Function;
 - 5. Appearance;
 - 6. Quality and durability;
 - 7. Any required license fees or royalties;
 - 8. Warranty terms and conditions;

The contractor shall submit a separate request for each product, supported with complete data, with drawings and samples as are appropriate to substantiate the above.

B. The Architect, as set forth in the Post Bid Requirements in Section 002100, will

review requests for substitutions with reasonable promptness, and notify the Contractor, in writing, of the decision to accept or reject the requested substitution.

- 1.05 OPTIONS
 - A. Where Technical Specifications permit Contractor to select optional materials, items, systems, or equipment, the selection of such options is subject to the following conditions:
 - 1. Once an option has been selected and approved, it shall be used for the entire contract.
 - 2. The Contractor shall coordinate his selection with the drawings and specifications and make all necessary adjustments without additional cost to the Owner.

1.06 CONTRACTOR'S REPRESENTATION

- A. A request for a substitution constitutes a representation that the Contractor:
 - 1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified;
 - 2. Will provide the same warranties or bonds for the substitution as for the product specified;
 - 3. Will coordinate the installation of an accepted substitution in the work, and make such other changes in the work as may be required for installation to make the work complete in all respects;
 - 4. Will waive all claims for additional costs, under its responsibility, which may subsequently become apparent.
 - 5. Will have coordinated installation with all affected trade contractors, specialty contractors and the like and will be responsible for any and all costs which may arise as a result of this substitution.

1.07 REIMBURSEMENTS

A. As outlined in Section 013300, when resubmittals of materials, equipment and accessories to be incorporated in the project are necessary due to failure of Contractors to properly coordinate submittals, the submitting Contractor shall compensate the Design Professionals for required re-reviews of said submittals in accordance with the following fee schedule:

Principal's Time......\$ 250.00 per hour Associate's Time......\$ 175.00 per hour Employees Time.......Direct Personnel Expenses X 3.0

Engineer's Time..... \$ 200.00 per hour

The charges incurred will be deducted from the ensuing requisition at the direction of the Owner.

End of Section

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SUBSTITUTION REQUEST FORM

<u>To:</u>				Project:
Section	Page	Paragraph	Specified Item	

THE UNDERSIGNED REQUESTS CONSIDERATION OF THE FOLLOWING SUBSTITUTION:

Attached data shall include, in a tabular format to provide a line by line comparison - product description, specifications, drawings, photographs, performance and laboratory tests and the like with applicable portions of said data <u>clearly</u> identified.

FURTHER, The Proposed Substitution WILL (OR WILL NOT) Affect:

(NOTE - If Substitution WILL affect any item above, explain in detail.)

In addition to the above, the undersigned agrees to pay for -

- 1. Any and all changes to the building design, including structural, civil or electro/mechanical systems engineering (if any), detailing; <u>and</u>
- 2. Any and all additional construction costs caused by the requested substitution.

The undersigned further states that the function, appearance and quality of the Proposed Substitution are equivalent or superior to the Specified Item.

SUBMITTED:	DESIGN P	DESIGN PROFESSIONAL'S COMMENTS			
By:	Accepted	Accepted as Noted			
Firm: _	Not Accepted	Received Too Late			
Address:					
		By:			
Date:		Date:			
Telephone/Fax:		Remarks:			
Approved For Subcontractor Submittal:					
By:	Contractor:	Date:			

SECTION 012900

APPLICATIONS FOR PAYMENT

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment, and supplements provisions of the Contract.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Schedule of Values
- B. Applications for Payment
- 1.03 SCHEDULE OF VALUES
 - A. Coordination: Each prime Contractor shall coordinate preparation of its Schedule of Values for its part of the Work with preparation of the Contractors' Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's Construction Schedule.
 - b. Application for Payment forms, including Continuation Sheets.
 - c. List of subcontractors.
 - d. Schedule of alternates.
 - e. Schedule of allowances
 - f. List of products.
 - g. List of principal suppliers and fabricators.
 - h. Schedule of submittals.
 - 2. Submit the Schedule of Values to the Architect and Construction Manager at the earliest possible date but no later than seven (7) days before the date scheduled for submittal of the initial Applications for Payment.
 - 3. Subschedules: Where Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
 - B. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values. Provide at least one line-item for each Specification Section. For major trades with total line items exceeding \$25,000, provide a separate, back-up breakdown of each such trade with line items for identifiable units of work within such trade each of which has a value not exceeding \$25,000. Provide a computed unit price for each line total.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of the Architect
 - c. Name of the Construction Manager
 - d. Project number.
 - e. Contractor's name and address.
 - f. Date of submittal.

- 2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division
 - b. Description of Work
 - c. Name of subcontractor
 - d. Name of manufacturer or fabricator
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value
 - g. Dollar value
 - h. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent
 - i. Phase Area (as applicable)

<u>NOTE</u>: Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.

- 3. Provide a breakdown of the Contract Sum by Phase Area in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
- 4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
- 5. Provide a separate line item in the Schedule of Values for each part of the Work where Application for Payment may include materials or equipment, purchased or fabricated and stored, but not installed.

Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.

- 6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. Unit Price Work: Show the line-item value of unit-cost allowances, as a product of the unit multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.
- 8. Temporary facilities, clean up and other major cost items and correction of existing conditions are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.
- 9. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders result in a change in the Contract Sum.

1.04 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.

The initial Application for Payment, the Application for Payment at time of Substantial Completion and the final Application for Payment involve additional requirements.

- B. Payment-Application Times: Each progress-payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement or in absence thereof the previous month.
- C. Payment-Application Forms: Use AIA Document G732 and Continuation Sheets G703 as the form of Applications for Payment. Separate Continuation Sheets shall be provided for work which takes place on each building which shall detail that portion of the contract which is attributable to the specific building. The project name shall be clearly shown on the top of each continuation form.
- D. Application Preparation: Complete every entry on the form. Include notarization and execution of person authorized to sign legal documents on behalf of the Contractor. The Architect and Construction Manager will reject, and return, incomplete applications without action.
 - 1. Entries shall match data on the approved Schedule of Values and the Contractor's Construction Schedule. Update schedules if revisions were made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
 - 3. Provide copies of payrolls which are signed and notarized documenting compliance with prevailing wage laws as applicable to particular project.
- E. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to the Architect by a method ensuring receipt within 24-hours. One copy shall be complete, including waivers of lien and similar attachments, when required.

Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect.

- F. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub subcontractors and suppliers for the construction period covered by the previous application.
 - 1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit final or full waivers.
 - 3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.

Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

4. Waiver Forms: Submit waivers of lien on forms provided, and executed in a manner, acceptable to the Owner.

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- G. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, shall include the following prerequisites to processing:
 - 1. List of subcontractors, approved
 - 2. List of principal suppliers and fabricators, approved
 - 3. Schedule of Values, approved
 - 4. Contractor's Construction Schedule, approved
 - 5. Schedule of principal products
 - 6. Schedule of unit prices, approved
 - 7. Submittal Schedule, approved
 - 8. List of Contractor's staff assignments
 - 9. List of Contractor's principal consultants
 - 10. Copies of building permits as applicable to project requirements
 - 11. Copies of authorizations and licenses from governing authorities for performance of the Work
 - 12. Initial progress report
 - 13. Report of pre-construction meeting
 - 14. Certificates of insurance and insurance policies
 - 15. Performance and payment bonds
 - 16. Data needed to acquire the Owner's insurance
 - 17. Initial settlement survey and damage report, if required by particular project
 - 18. Safety plan
- H. Monthly Application for Payment Administrative actions and submittals, that must precede or coincide with submittal of the periodic Application for Payment, shall include the following:
 - 1. As-built Record documents, required documents and submittal records on site
 - 2. Contractor's construction schedule, updated, with corrective action plan as applicable.
 - 3. Material Status Report
 - 4. Stored Materials forms
 - 5. Submittal Schedule and submittal status reports
 - 6. RFI submittal and status log
 - 7. Monthly Progress report, and Notarized Progress Report Statement from each Contractor's manager/superintendent stating that the work is on schedule, and that Contractor will meet the Substantial Completion date for the Work, and the Substantial Completion dates for every portion established under Construction Phasing Schedule Section
- I. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
 - 1. This application shall reflect Certificates of Partial Substantial Completion issued previous to Owner occupancy of designated portions of the Work.
 - 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Test/adjust/balance records.
 - d. Maintenance instructions.

- e. Meter readings.
- f. Startup performance reports.
- g. Changeover information related to Owner's occupancy, use, operation, and maintenance
- h. Final cleaning.
- i. Application for reduction of retainage and consent of surety.
- j. Advice on shifting insurance coverages.
- k. Final progress photographs.
- I. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.
- J. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
 - 1. Completion of Project closeout requirements.
 - 2. Completion of items specified for completion after Substantial Completion.
 - 3. Ensure that unsettled claims will be settled.
 - 4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
 - 5. Transmittal of required Project construction records to the Owner.
 - 6. Certified property survey as and/if required by project documents.
 - 7. Proof that taxes, fees, and similar obligations were paid.
 - 8. Removal of temporary facilities and services.
 - 9. Removal of surplus materials, rubbish, and similar elements.
 - 10. Change of door locks to Owner's access.
 - 11. Consent of Surety to final payment.

Part 2 - PRODUCTS - NOT USED

Part 3 - EXECUTION - NOT USED

am an officer with the title of _____

in the firm of ______ and am authorized by that firm to sign and swear, under penalty of perjury, to the validity and accuracy of the statements below.

(1) I pay or supervise the payment of laborers, workers and mechanics employed by _____

on the project. During the payroll period commencing on the ______ day of ______ 20___ and ending the ______ day of ______ 20____ all laborers, workers and mechanics employed on said project were paid the wages and supplements recorded as earned on the attached payroll records. No deductions have been made either directly or indirectly from the wages and supplements other than deductions shown on the payroll records.

(2) The payroll records submitted for the above project and attached hereto are correct and complete, and the wage rates for laborers, workers, and mechanics contained therein are not less than the applicable wage rates stated in the Contract and as designated by the State Labor Department. The number of hours shown for each employee reflects the actual hours worked by that employee. The classification shown for each employee is accurate and conforms with the work he or she performed.

(3) Supplements required in the Contract that are in addition to the basic hourly wages have been or will be paid to the appropriate plans, funds or programs.

(4) Such statement so to be filed shall be verified by the oath of the Contractor that he or she has read such statement subscribed by him or her and knows the content thereof, and that the same is true of his or her own knowledge except with respect to wages and supplements owing by subcontractors which may be certified upon information and belief.

(5) All employees of this firm have submitted completed Form I-9, Employment Eligibility Verification Form which has been reviewed and signed by authorized representatives of the firm and are kept in the employees' file. Also, any and all subcontractors have certified to us that all of their employees have submitted completed Form I-9 Employment Eligibility Verification Form, which have been reviewed and signed by authorized representatives of the firm and are kept in the employees' file.

	Firm	
	Name	
	Firm	
	Address	
Prime	NOTARY	
Subcontractor		

REQUISITION FOR PARTIAL PAYMENT - WAIVER OF LIENS

PROJECT	OWNER
GENERAL CONTRACTOR	SUBCONTRACTOR/VENDOR
CONTRACT	WORK COMPLETE
PROJECT:	CONTRACT - \$
TRADE:	CHANGE ORDERS - \$
CONTRACT - \$	TOTAL COMPLETE - \$
CHANGE ORDERS - \$	RETAINAGE (%) - \$
TOTAL CONTRACT - \$	LESS PRE. REQ \$
	THIS REQUISITION - \$

Waiver of Liens

The undersigned, upon receipt of the above requisition payment hereby releases and discharges the Owner of and from any liability or obligation in any way related to or arising out of this project up to and including the date of this document.

The undersigned further covenants and agrees that it shall not in any way claim or file a mechanic's or other lien against the premises of the above designated project, or any part thereof, or against any fund applicable thereto for any of the work, labor, materials heretofore furnished by it in connection with the improvement of said premises.

The undersigned further warrants that, in order to induce the Owner to release this partial payment, they have paid all claims for labor, material, insurance, taxes, equipment, etc., employed in the prosecution of the work above, to date of this requisition.

The undersigned hereby releases and agrees to hold the Owner harmless from any and all claims in connection with the furnishing of such labor and materials, etc., for the construction of the aforementioned project.

The undersigned further guarantees that all portions of the work furnished and/or provided by them are in accordance with the contract and that the terms of the contract with respect to these guarantees will hold for the period specified in said contract.

IN WITNESS WHEREOF, we have executed under seal this release on the date below and to be legally bound hereby:

WITNESS:	_ FIRM:

BY:_____ DATE: _____

CORPORATE ACKNOWLEDGEMENT
State of)SS.
) County of
On the day of, before me came to me known and who by me being duly sworn did depose and say that he resides at; that he is the officer of the said corporation executing the foregoing instrument, that he knows the seal of said corporation, that the seal affixed to said instrument is such corporate seal, that is was so affixed by order of the Board of Directors of said corporation and that he signed his name therefore by like order.
Notary Public
INDIVIDUAL ACKNOWLEDGEMENT
State of)SS.
County of
On the day of, before me came to me known and who by me being duly sworn did depose and say that he resides at that he is the individual who executed the foregoing instrument.
Notary Public
PARTNERSHIP ACKNOWLEDGEMENT
State of)SS.
County of
On the day of, before me came to me known and who by me being duly sworn did depose and say that he resides at doing; that he is the partner in the firm of doing
business under the name of and that he executed the foregoing instrument on behalf of said partnership.

Notary Public

SECTION 013113

PROJECT COORDINATION

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 011000, Article 1.01.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Coordination of Work
- B. Trade Contractor Obligations

1.03 COORDINATION OF WORK

A. As required by the General Conditions, and restated herein, each Trade and/or Specialty Contractor or Subcontractor shall compare the architectural, structural, civil/site, mechanical and electrical Drawings and Specifications with those for all other trades and shall report any discrepancies between them to the Architect, thru the Construction Manager, and obtain from him written instructions for changes necessary to the work.

All work shall be installed in cooperation with other trades installing interrelated work.

Before installation, each Trade Contractor shall make proper provisions to avoid interference in a manner approved by the Architect.

All changes required in the work caused by neglect to so advise the Architect shall be made by the offending Contractor at his own expense.

B. Each Trade Contractor shall be responsible for exact location of anchor bolts, sleeves, inserts, supports, chases, conduits and openings that may be required for the work.

Attention is directed to Section 013114. Each Trade Contractor shall prepare layout drawings for incorporation of items to be built-in the work, pass through the work and the like in sufficient time so as not to cause any undue delay in the execution of the work.

Built-in items shall be furnished under the same Section of the Specifications as the respective items to be supported, and they shall be installed, except as otherwise specified, by the trade furnishing and installing the material in which they are to be located.

The trade responsible for the installation of anchor bolts shall also insure that they are properly installed.

Chases, conduits and openings shall be laid out in advance to permit provision in work.

Sleeves and inserts shall not be used in any portion of the building, where their use would impair strength or construction features of the building.

Sleeves, conduits and inserts shall be set in forms before concrete is poured.

Extra work required where anchor bolts, supports, sleeves, chase openings, conduits or inserts have been omitted or improperly placed shall be performed at expense of trade which made error or omission.

- C. Slots, chases, openings and recesses through floors, walls, ceilings and roofs as specified will be provided for the various trades in their respective materials under general construction work, but the trade requiring them shall see that they are properly located and shall do any cutting and patching caused by the neglect to do so.
- D. Locations of pipes, ducts, electrical raceways, switches, panels, equipment, fixtures, etc. shall be adjusted to accommodate the work to interferences anticipated and encountered.

Each Trade Contractor shall determine, and submit for approval, the exact route and location of each pipe, duct and electrical raceway prior to fabrication.

Approval by the Architect is required prior to any such modifications.

E. Lines which pitch shall have the right of way over those which do not pitch.

For example, plumbing and condensate piping drains shall normally have right of way.

Lines whose elevations cannot be changed shall have the right of way over lines whose elevations can be changed.

- F. Offsets, transitions and changes in direction in pipes, ducts and electrical raceways shall be made as required to maintain proper headroom and pitch of sloping lines whether or not indicated on the Drawings. Each Trade Contractor shall provide air vents, sanitary vents, pull boxes, etc.; as required to effect these offsets, transitions and changes in direction.
- G. Each Trade Contractor shall install all mechanical and electrical work to permit removal (without damage to other parts) of coils, heat exchanger bundles, fan shafts and wheel, draw-out circuit breakers, filters, belt guards, sheaves and drives and all other parts requiring periodic replacement or maintenance. Each Trade Contractor shall arrange pipes, ducts, raceways, traps, starters, motors, control components, and the like, to clear the openings of swinging and overhead doors and of access panels.
- H. The General Contractor shall provide temporary weathertight and protected openings in structure to facilitate placement of equipment.

1.04 TRADE CONTRACTOR OBLIGATIONS

- A. The Trade Contractors are required to supply all necessary supervision and coordination information to any other trades who are supplying work to accommodate the electrical and mechanical installations.
- B. Where a trade is required to install items which it does not purchase, it shall include for such items:
 - 1. The coordination of their delivery.
 - 2. Their unloading from delivery trucks driven in to any designated point on the property line at grade level.
 - 3. Their safe handling and field storage up to the time of permanent placement in the project.
 - 4. The correction of any damage, defacement or corrosion to which they may have been subjected.
 - 5. Their field assembly and internal connection as may be necessary for their proper operation.
 - 6. Their mounting in place including the purchases and installation of all dunnage supporting members and fastenings necessary to adapt them to architectural and structural conditions unless support members are shown on structural or architectural drawings.
 - 7. Their connection to building systems including the purchase and installation of all terminating fittings necessary to adapt and connect them to the building systems.
- C. Items which are to be installed but not purchased as part of the work of a particular trade shall be carefully examined by this trade upon delivery to the project.

Claims that any of these have been received in such condition that their installation will require procedures beyond the reasonable scope of the work of the installing trade will be considered only if presented in writing within one week of the date of delivery to the project of the items in question.

The work of the installing trade shall include all procedures, regardless of how extensive, necessary to put into satisfactory operation, all items for which no claims have been submitted as outlined above.

SECTION 013114

COORDINATION DRAWINGS AND PROCEDURES

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 011000, Article 1.01.
- D. Coordination of the work shall be performed as outlined below.

E. Coordination drawings are critical to the proper execution of the Work and failure to comply with these requirements may become the basis for claims and/or denial of claims in accordance with the Contract.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Scheduling (Coordinate with Section 013200)
- B. Coordination Drawings and Procedures General Construction Work
- C. Coordination Drawings and Procedures Mechanical/Electrical Work
- D. Meetings
- E. Penalties
- 1.03 SCHEDULING
 - A. Development of coordination drawings shall begin immediately upon award and shall not be dependent upon structural shop drawings; development shall be based upon structural information included on the Contract Documents.
 - B. During the "final" review of the coordination drawings, the approved structural shop/fabrication drawings shall be checked and any conflicts identified. General Contractor shall coordinate and insure structural shop drawings are processed so as to meet this requirement. Failure to prosecute same in a timely manner will be cause for implementation of penalties as outlined in 1.07 herein.
 - C. Sheet metal specialty contractor or subcontractor shall provide initial drawings as indicated in Article 1.05 herein within six (6) weeks of issuance of Letter or Intent or Contract, whichever is earliest. Time to complete all drawings may vary based upon size and complexity of project. Extension to the six (6) weeks for final coordination drawings shall be determined prior to award by the Design Professional Team in consultation with the Contractors.
 - D. Each subsequent contractor, as listed in 1.05.E shall complete their work within three (3) weeks of receipt of the sheet metal drawings.
 - E. Progress of coordination drawings must be reported at every project meeting until accepted.
- 1.04 COORDINATION DRAWINGS AND PROCEDURES GENERAL CONSTRUCTION WORK
 - A. The Contractor shall provide fully integrated building, structural, mechanical/electrical coordination drawings and field installation layouts for such work as directed by the Architect and/or Construction Manager <u>and/or</u> required by

job requirements so as to resolve tight field conditions except as modified in Paragraph 1.05 below.

- B. These composite shop drawings and field installation layouts shall be coordinated in the field among the Contractors to verify the proper relationship to the work of other trades based on field conditions, and shall be checked for accuracy and approved by the Contractors before submission to the Architect for his review and concurrence and shall become the basis for more specific shop drawing submittals as required by the technical specifications.
- C. Reflected Ceiling Systems as described in Technical Sections with the "Base" drawings for ceiling work for each area composed of reflected ceiling plans with overlay of contract drawings *for* structural framing. Elevations of bottom of structural members and ceiling heights to be clearly identified.
 - 1. Section 092900, Gypsum Drywall GENERAL CONTRACTOR RESPONSIBILITY.
 - 2. Section 095113, Acoustical Panel Ceilings SPECIALTY CONTRACTOR RESPONSIBILITY.

The reflected ceiling drawings shall then be forwarded to the next succeeding Contractor in the following order:

- 1. Sheet Metal Subcontractor.
- 2. Fire Protection (Sprinkler) Subcontractor (As applicable);
- 3. HVAC Piping and Associated Control Systems.
- 4. Plumbing System.
- 5. Electrical.
- 6. General Contractor for final structural review and submission to the Architect when all internal coordination requirements have been satisfied.
- 1.05 COORDINATION DRAWINGS AND PROCEDURES MECHANICAL/ELECTRICAL WORK
 - A. Mechanical/electrical work shall be coordinated as indicated by the following procedure.
 - B. The HVAC Contractor and/or the Sheet Metal Subcontractor shall prepare a complete draft set of drawings on "bond" to act as background drawings at scale not less than 3/8 inch equals 1 foot, showing structure and other information as needed for coordination. He shall show sheet metal layout thereon. Upon acceptance of these "bond" drawings, the HVAC Contractor shall plot, or have plotted, a final coordination set on Vellum and these will be the Coordination Drawings.
 - C. <u>ALL FIREWALLS AND SMOKE PARTITIONS MUST BE HIGHLIGHTED ON THE</u> <u>SHEET METAL DRAWINGS FOR APPROPRIATE COORDINATION.</u>
 - D. The main paths of egress and for equipment removal, from main mechanical and electrical rooms must be clearly shown on the coordination drawings.
 - E. Each of the below specialty trades shall add its work to these background drawings with appropriate elevations and grid dimensions using a color coding system to be developed between trades.

Specialty trade information is required for fan rooms and mechanical rooms, horizontal exits from duct shafts, crossovers, and for spaces in and above ceilings where congestion of work may occur such as corridors, and even entire floors.

Drawings shall indicate horizontal and vertical dimensions, to avoid interference

with structural framing, ceilings, partitions, and other services.

- 1. <u>Specialty Trades</u>
 - a. Sheet Metal Subcontractor.
 - b. Fire Protection (Sprinkler) Subcontractor (As applicable);
 - c. HVAC Piping and Associated Control Systems.
 - d. Plumbing System.
 - e. Electrical.
 - f. General Contractor.
- F. Each specialty trade shall sign and date each mylar coordination drawing. Return drawings to the Sheet Metal Subcontractor, who shall route them sequentially to all specialty trades.
- G. Where conflicts occur with placement of materials of various trades, the Sheet Metal Subcontractor will be responsible to coordinate the available space to accommodate all trades. Any resulting adjustments shall be initialed and dated by the specialty trade. The Sheet Metal Subcontractor shall then final date and sign each drawing. If he cannot resolve conflicts, the decision of the General Contractor shall be final.
- H. A Subcontractor who fails to promptly review and incorporate his work on the drawings shall assume full responsibility of any installation conflicts affecting his work and of any schedule ramifications.
- I. Sheet Metal Subcontractor shall make copies of all coordination drawings. Fabrication shall not start until such transparencies of completed coordination drawings are received by the Architect/Engineer and have been reviewed.
- J. Review of coordination drawings shall not diminish responsibility under this Contract for final coordination of installation and maintenance clearances of all systems and equipment with Architectural, Structural, Mechanical, Electrical and other work.
- K. After Architect/Engineer Review:
 - 1. After review of coordination drawings, the method used to resolve interferences not previously identified shall be as in 1.06 "MEETINGS" below.
 - 2. All changes to reviewed coordination drawings shall be approved in writing by the Architect/Engineer prior to start of work in affected area.
- L. Distribution of Coordination Drawings:
 - 1. The Sheet Metal Subcontractor shall provide the following distribution of documents:
 - a. One vellum of each Coordination Drawing to each specialty trade and affected Contractor for their use.
 - b. One vellum of each Coordination Drawing to Owner.
 - c. One vellum of each coordination drawing to General Trades Contractor.
 - d. One vellum of each coordination drawing to the Construction Manager.

<u>NOTE</u>: Electronic documents (CAD files) can be used for these operations based upon agreement between all parties and in accordance with terms and conditions set for obtaining of CAD files as per attachment to Section 013300.

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- M. Coordination Drawings include but are not necessarily limited to:
 - 1. Structure.
 - 2. Partition/room layout.
 - 3. Ceiling tile and grid.
 - 4. Light fixtures.
 - 5. Access panels.
 - 6. Sheet metal, coils, boxes, grilles, diffusers, etc.
 - 7. HVAC piping and valves.
 - 8. Smoke and fire dampers.
 - 9. Soil, waste and vent piping.
 - 10. Water piping
 - 11. Roof drain piping.
 - 12. Major electrical conduit runs, panelboards, feeder conduit and racks of branch conduit.
 - 13. Above ceiling miscellaneous metal.
 - 14. Fire Protection Systems.
 - 15. Heat tracing of piping.
 - 16. Equipment support, anchors, guides and seismic restraints.
- N. The color coded transparencies shall be kept at the Owner's Representative's field office for future reference in the event of conflict between the trades.
- O. All coordination drawings shall be delivered to the Architect at the end of the project as part of the record drawing requirements set forth in Article 3.11.2 of the General Conditions.
- 1.06 MEETINGS Coordinate with Section 013119
 - A. Coordination meetings to resolve interferences in the work will be held at the project site under the direction of the Architect and Construction Manager.
 - B. <u>Representatives of each Contractor shall be present at each meeting</u>.
 - C. <u>Each Contractor shall provide the necessary manpower and/or overtime to insure</u> that the coordination process described herein does not delay the Project <u>Schedule.</u>
- 1.07 PENALTIES
 - A. FAILURE OF ANY INDIVIDUAL PRIME CONTRACTOR TO PARTICIPATE IN THE PREPARATION OF SAID COORDINATION DRAWINGS AND TO OBTAIN ARCHITECT'S REVIEW AND CONCURRENCE THEREOF WILL RESULT IN FORFEITURE OF THEIR RIGHT OF PAYMENT UNTIL SAID DRAWINGS ARE ACCEPTED.
 - B. REPEATED VIOLATIONS OF THIS CONTRACTUAL REQUIREMENT MAY RESULT IN TECHNICAL DEFAULT OF THE AGREEMENT BETWEEN THE OWNER AND THE OFFENDING PRIME CONTRACTOR;

HOWEVER, THE FAILURE OF THE OWNER TO SO TERMINATE SHALL NOT RELIEVE THE CONTRACTOR FROM FUTURE COMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS SECTION.

SECTION 013115

REQUESTS FOR INFORMATION (RFI)

Part 1 - GENERAL

- 1.01 This Section specifies administrative and procedural requirements for handling requests for information (RFI's) made after award of Contract.
- 1.02 Attention is directed to Sections 01 33 00 and 01 32 00 of Division #1 as same concerns construction progress schedules, submittal schedules and submittals of shop drawings, samples and product data in general.
- 1.03 SUBMITTAL PROCEDURES: RFI's shall be submitted in the following manner:
 - A. One (1) completed copy of form following to Architect and Construction Manager with copies to Owner (as directed) and appropriate Consultants with the following minimum information:
 - 1. Work identified by RFI listing affected Drawing(s) and specific detail(s) and Specification paragraph reference(s).
 - 2. Identify specific field conditions and "as-built" conditions on sketches attached to RFI submittal.
 - 3. If RFI addresses conflict(s) in, or between, Contract Documents, describe completely and provide such data necessary to permit thorough and proper response by affected discipline.
 - 4. Indicate proposed solution along with any impacts on cost and construction time.
 - 5. Listing of Trade/Specialty Contractors affected by RFI and indication that RFI proposal has been coordinated with said contractors.

INCOMPLETE RFI'S WILL BE RETURNED TO CONTRACTOR WITHOUT ACTION TAKEN.

- 1.04 REVIEW PROCEDURES/ACTIONS
 - A. Architect/Engineer may request additional information or documentation as may be deemed necessary for fair evaluation of RFI.
 - B. Architect/Engineer will respond with reasonable promptness as outlined in Section 01 33 00 in writing and may, if deemed appropriate, issue a "Bulletin" as a clarification to the Contract Documents.

Date of Request:		RFI NUMBER	
Contractor:		Architect: KG+D Architects, PC	
Address:		Address: 285 Main St., Mt. Kisco, NY 10549	
Telephone:		Telephone : 9 ⁻	14.666.5900
Fax:		Fax : 914.666.0051	
Email:		Email: rfendler@kgdarchitects.com	
Project Name:		Project Location:	
Description, complete with bac	kup data as neces	ssary attached h	iereto:
Sketches of Conditions	Spec Reference	:	Drawing Reference:
Proposed Solution:			
Cost Impact:		Time Impact:	
Trade/Specialty Contractors Affe	ectea:		
Trade/Specialty Contractors Co	ordinated With:		
Submitted By:			
Architect's Response:			
Poenoneo Ru:		Date of Respo	
Response By:			1156.

SECTION 013119

PROJECT MEETINGS

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" that may be involved with the work of this Project shall be as set forth in Section 011000, Article 1.01.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Initial (Kick-Off or Orientation) Meeting
- B. Regular Project Meetings
- C. Job Progress Meetings
- D. Pre-Installation Meetings
- E. Job Coordination Meetings
- F. Mockup Review Meetings
- G. Recording

<u>NOTE</u>: As part of all individual meetings outlined above there shall be a Waste Management program discussion held with all responsible parties in attendance.

1.03 INITIAL (KICK-OFF OR ORIENTATION) MEETING

- A. The Construction Manager will schedule the initial job meeting, <u>prior to the start of</u> <u>any work</u>, at the project site and will notify all parties concerned of the time and place of the meeting.
- B. Attendance:
 - 1. Prime Contractors
 - 2. Construction Manager.
 - 3. Architect and principal consultants.
 - 4. Major subcontractors and suppliers as deemed appropriate.
 - 5. Representative of Testing Laboratory if independent.
- C. Review and Discuss:
 - 1. Relation and coordination of various parties, and responsible personnel for each party.
 - 2. Use of premises, including office and storage areas, temporary controls, and security procedures.
 - 3. Construction schedule and critical work sequencing.
 - 4. Use of project management software
 - 5. Processing of:
 - a. Contract modifications.
 - b. Shop Drawings, Product Data, and Samples.
 - c. Applications for Payment.
 - d. Substitutions.
 - e. Requests for Information.
 - f. Other required submittals.

- 6. Adequacy of distribution of Contract Documents.
- 7. Procedures for maintaining contract closeout submittals.
- 8. Installation and removal of temporary facilities.
- 9. Notification procedures and extent of testing and inspection services.

1.04 REGULAR PROJECT MEETING AGENDA

- A. Coordinate the Work of the Project (Reference Section 01 31 14).
- B. Establish a sound working relationship among the Contractors, the Architect and the Owner.
- C. Review and update progress, submittal and delivery schedules.
- D. Review job progress.
- E. Review progress payment requests; change proposals and change orders.
- F. Expedite the work to completion within the project schedule.
- G. Provide a 2 week look ahead schedule.
- 1.05 PRE-INSTALLATION CONFERENCES
 - A. Where required in individual specification Section, convene a pre-installation conference at project site or other designated location.
 - B. Require attendance of parties directly affecting or affected by work of the specific Section.
 - C. Review conditions of installation, preparation and installation procedures, and coordination with related work.
- 1.06 JOB PROGRESS MEETINGS
 - A. Unless otherwise directed, bi-weekly job meetings will be held by the Construction Manager. Present at these meetings shall be EACH CONTRACTOR or a representative authorized to make commitments for action on behalf of the Contractor and the Owner.
 - B. EACH CONTRACTOR shall arrange for the participation of its Subcontractors when their presence is required by the Construction Manager and/or the Architect.
 - C. The minimum agenda will cover:
 - 1. Review minutes of previous meetings.
 - 2. Note field observations, problems, and decisions.
 - 3. Identify present problems and resolve them.
 - 4. Plan work progress during next work period and its effect on the related work of others.
 - 5. Review shop drawings and submittal schedules.
 - 6. Review change order status.
 - 7. Review status of construction progress schedule.
 - 8. Coordinate occupancy arrangements and access requirements with Owner.
 - 9. Discussions on waste management requirements as outlined in Section 01 74 19 shall be part of the agenda.
- 1.07 JOB COORDINATION MEETINGS (Reference Section 01 31 14)
 - A. On a bi-weekly basis, either on the day of the schedule job progress meeting, or such other time established, a "working" coordination meeting will be held at the project site. Present at these meetings shall be **each contractor's site**

supervisor with men working, or scheduled to work within the ensuing 2 weeks, and the Construction Manager.

Further, prior to the start of any major trade work, a coordination meeting following the guidelines established herein shall be held subject to the same parties presence as for general meetings.

- B. Meeting shall be used to coordinate work between contracts for the ensuing 2 weeks. At the close of the meeting, each supervisor shall, in an agreed format, provide a summarized 2 week work plan to the other contractors and the Construction Manager.
- C. The time and place for the meetings will be as established in the preconstruction meeting.
- D. Minutes will be taken by the Construction Manager who will provide, at the next regular progress meeting, a verbal report of the date and time of the last coordination meeting and a listing of those present.
- 1.08 MOCKUP REVIEW MEETING If Specified in Technical Sections
 - A. Prior to start of any mockup that may be specified or required herein or within the technical specifications the following shall be accomplished:
 - 1. Submittal of shop drawings for respective mockup;
 - 2. Submittal of samples for respective mockup;
 - 3. Coordination and review meeting between specialty contractors responsible for mockup and Architect and Construction Manager.
- 1.09 RECORDING: The Construction Manager will take the minutes of all meetings and distribute them to all parties present and to those on the distribution list given out at the orientation meeting within 48 hours of the meeting.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

SECTION 013200 - SCHEDULING AND PROGRESS

1.01 GENERAL

C.

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the "Conditions of the Contract" and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
 - Definitions as apply to "Contractors" involved with the work of this Project.
 - 1. "Contractor for General Construction (CGC)" meaning the party responsible for the preparation of, and monitoring of, the <u>coordinated</u> <u>project progress schedule</u> (CPPS) prepared in consort with the "Prime Contractors" as defined below;
 - 2. "The Contractor" or "Contractor" meaning that Prime Contractor normally responsible for that work referenced;
 - "Prime/Trade Contractor" meaning either the Site, General, Plumbing, HVAC or Electrical Contractors normally responsible for the referenced work;
 - 4. "Coordinated Project Progress Schedule (CPPS)" meaning that schedule prepared by the "Contractor for General Construction" with all required input from each of the "Prime Contractors" as defined in Paragraph 1.01.C.3 above.

and such other terms relating to Contractors to be taken in context with respect to referenced work.

- D. The requirements set forth within this section are directed to all Contractors involved in the work and shall be considered <u>mandated</u> requirements subject to penalties as defined elsewhere in this Section.
- E. The coordinated project progress schedule (CPPS) shall be in the form of a CPM schedule and shall be prepared and maintained using Primavera Scheduling Program. Excel bar charts will not be acceptable. The schedule submitted shall be a complete, time-scaled CPM network analysis diagram for the Work
- F. All Prime Contracts shall provide their input to the CPPS in whatever format is required by the GC to produce the overall CPM network analysis diagram for the Work.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Preliminary Requirements
- B. Commencement, Prosecution and Completion of the work
- C. Coordinated Submittal Schedules
- D. Proposed Product List and Status Report on Material Orders See Article 1.11 of Section 01 33 00; failure to comply with these requirements shall result in rejection of schedules and withholding of any requisitions.
- E. Coordinated Project Progress Schedule
- F. Breach of Contract
- G. Time of Completion

- 1.03 PRELIMINARY REQUIREMENTS (Coordinate with Post-Bid Requirements set forth in Section 00 21 00)
 - A. Within seven (7) days after bids are opened, and before the Contract is executed, the three (3) apparent low bidder for each trade/contract must submit to the Architect and Construction Manager, in writing, a list of duration's and a sequence, in the form of a bar chart, for all activities that are the responsibility of the bidder. Contractor's proposed work force and other resource loading for each activity of the bar chart, broken down by trades, must also be provided. Failure to comply with this requirement may be cause for rejection of the bid.
 - B. The apparent low bidders, concurrent with the submission of bar chart for each school, shall also submit to the Architect and Construction Manager, in writing, the following information:
 - 1. Shop drawing and material sample schedules keyed to the duration's submitted in the bar chart. (See Section 01 33 00)
 - 2. Schedules for the award of subcontractor and equipment contracts keyed to the duration's submitted for the bar chart.
 - 3. The name of the person who, as Scheduling Coordinator for the apparent low bidder, is authorized to act on behalf of the apparent low bidder on all matters of scheduling included in this Section. Once named, the Scheduling Coordinator may only be replaced after written notice is given to the Architect and Construction Manager. The Contractor agrees, upon the request of either of the two parties, to replace the Scheduling Coordinator.
 - C. Failure to comply with this subsection 1.03 of this Section of the General Requirements may be cause for rejection of the bid and forfeiture of security. (See the "Post-Bid Procedures" in the Instructions to Bidders.)

1.04 COMMENCEMENT, PROSECUTION AND COMPLETION OF THE WORK

- A. Contractor shall commence work under this contract upon receipt by him of Letter of Intent to Award, Notice to Proceed, and/or Execution of the Contract, and shall prosecute said work diligently and complete the work within the stated calendar days for each portion of the work as set forth in Section 01 10 00.
- B. The time stated for completion for contract work includes final cleanup of area. Upon completion of total Contract work, ALL AREAS SHALL BE CLEAN.
- C. The Contractor is to carry on responsibility for services and maintenance of such items as temporary roads, walks, ramps, field offices, parking areas, environmental controls and the like until work under this contract is complete, unless otherwise directed by the Owner. Coordinate work herein with Section 01 10 00, Description of Work.

1.05 COORDINATED SUBMITTAL SCHEDULES

A. Within two (2) weeks after receipt of Letter of Intent to Award, Notice to Proceed, and/or Execution of the Contract, <u>each Contractor shall submit</u>, to <u>each other for</u> <u>review and comment prior to submittal to the Contractor for General Construction</u>, a detailed listing of all items to be incorporated within the work, including all items of mechanical and electrical.

This agreed upon information will then be incorporated in the "CPPS" as prepared by the "CGC" in accordance with Paragraph 1.05 of this Section. Listing should generally include the following:

- 1. Overall project milestones;
- 2. Proposed products list and status report on material orders.
- 3. Dates of shop drawing/sample submittals;
- 4. Guaranteed delivery dates after shop drawing and/or sample approvals;
- 5. Date of installation start;
- 6. Date of installation completion.

1.06 COORDINATED PROJECT PROGRESS SCHEDULE

A. Within two (2) weeks after receipt of Letter of Intent to Award, Notice to Proceed, and/or Execution of the Contract, but <u>prior to the actual start of the field work</u>, the Contractor for General Construction shall submit to the Construction Manage for his approval the proposed Coordinated Project Progress Schedule giving the information listed below.

In order to complete the "CPPS" <u>each Contractor shall submit to each other for</u> review, comment and time coordination prior to submittal to the Contractor for <u>General Construction</u>, their requirements so as to allow for said schedule to be drawn.

EACH CONTRACTOR SHALL SIGNIFY ACCEPTANCE OF SAID COORDINATED PROJECT PROGRESS SCHEDULE BY SIGNING PRIOR TO SUBMITTAL.

FAILURE OF THE "CGC" TO SUBMIT SAID COORDINATED PROJECT PROGRESS SCHEDULE AND TO OBTAIN APPROVAL THEREOF WILL RESULT IN FORFEITURE OF RIGHT OF PAYMENT UNTIL SAID SCHEDULE IS APPROVED.

SHOULD SUCH FAILURE BE CAUSED BY THE LACK OF COOPERATION ON THE PART OF ANY CONTRACTOR, SAID CONTRACTOR WILL BE PENALIZED BY FORFEITURE OF RIGHT OF PAYMENT AS WELL AS BEING HELD RESPONSIBLE FOR ANY DELAYS AND RESULTANT COSTS AS OUTLINED IN THE GENERAL CONDITIONS THAT MAY ACCRUE UNTIL SUCH PARTICIPATION IS FORTHCOMING AND SAID SCHEDULE IS APPROVED.

The minimum information contained within the required project progress schedule shall consist of -

- 1. The estimated dates the various classes of work included in the Schedule of Values will be started and completed.
- 2. The estimated percentages of completion to be obtained and the total dollar value of the various classes of said work projected to the end of each calendar month until substantial completion.

Calculations shall be based upon - work in place; materials on site and not installed; materials fabricated and stored under suitable conditions and insured to full value in a manner satisfactory to Architect Owner and Construction Manager; and such other items as may be agreed to among the Contractor, Architect, Construction Manager and Owner.

3. The estimated delivery and installation dates of the major pieces of

equipment to be furnished and installed by the Contractor.

- 4. The estimated projected progress of work that will be performed away from the job site.
- 5. A delineation of the work that will be performed by the Contractor's own forces and by his Subcontractors.
- 6. The estimated calendar dates on which all the work under the contract will be completed and ready for substantial completion and final inspections.
- B. The Coordinated Project Progress Schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation, and leading to a reasonable certainty of Substantial Completion by the date established in Section 01 10 00.

The "CPPS" will be reviewed by the Architect and Construction Manager for compliance with the requirements of this article and will be accepted by them or returned to the "CGC" for revision and resubmittal.

In the event that said schedule is returned, each contractor shall participate in the revision, as required, to prepare same for resubmittal.

Unless specifically required by law, no payment under this Contract shall be due until the Progress Schedule has been submitted to the Architect and Construction Manager and approved by both parties.

C. As the work progresses, an up-to-date copy of the "CPPS" with the actual percent completion of the various classes of the work indicated in red shall be submitted by the "CGC", with input from each Prime Contractor, to the Architect and/or Construction Manager during the first week of each calendar month. (Distribution to be established as part of "preconstruction meeting".

Each Prime Contractor shall sign the monthly schedules as a prerequisite to the requisitioning process.

The "CPPS" may be adjusted and revised to meet unforeseen job conditions, but such changes shall, at all times, be approved by the Architect and Construction Manager.

D. A copy of the "CPPS" shall be available at all times at the job site for the inspection and guidance of other Contractors, Subcontractors and Vendors engaged on any construction phase of the project.

It shall be the responsibility of Each Contractor to ascertain that all his Subcontractors, Vendors and Material men periodically consult the Schedule so that their work schedule shall be maintained in conformance with his own.

It shall also be the responsibility of Each Contractor to periodically consult the Job Progress Schedules of any other Contractors that may be engaged on any separate construction of the project, so that undue delay in progress on their part shall not delay the work of the other Contractors.

E. AN UP TO DATE COPY OF COORDINATED PROJECT PROGRESS

SCHEDULE MUST BE ATTACHED TO MONTHLY REQUISITION IN ORDER FOR PROCESSING TO BEGIN.

INCOMPLETE REQUISITIONS WILL BE REJECTED.

- 1.07 BREACH OF CONTRACT
 - A. The Contractor's failure to comply with any requirement called for in subsections 1.04, 1.05 and 1.06 above shall constitute a material breach of the Contract, and the Owner shall have the right to and may terminate the Contract, provided, however, that the failure of the Owner to so terminate shall not relieve the Contractor from future compliance.
- 1.08 TIME OF COMPLETION Coordinate with Article 8, Sections 00 70 00 and 01 10 00
 - A. Notwithstanding the implementation of the Construction Schedule, it is the sole responsibility of the Contractor to complete the Work within a Contract Time which will assure the substantial completion of the Project by the required date.

SECTION 013300

SUBMITTAL REQUIREMENTS

NOTE: SUBMISSIONS SHALL BE MADE ELECTRONICALLY USING THE PROJECT MANAGEMENT SOFTWARE "PROCORE" UTILIZED BY THE CONSTRUCTION MANAGER. EVERYTHING REQUIRED FOR THE PROJECT WILL BE IN PROCORE, INCLUDING DRAWINGS, SPECS, RFI'S, SUBMITTALS, MEETING MINUTES, ETC. CONSTRUCTION MANAGER WILL PROVIDE A SIGN-IN LINK TO EACH PRIME CONTRACTOR TO ENABLE THEM TO VIEW AND UPLOAD TO THE PROJECT SITE AS NEEDED. THE PROCESS WILL BE DISCUSSED AT THE KICK OFF MEETING PRIOR TO INITIAL START OF THE PROJECT.

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Where practical, submittals shall be made in groupings where installations are complimentary, i.e. steel, steel decking, steel stairs, stair railings; roof systems/flashings; etc. Failure to comply with this requirement will be cause for rejection of any or all submittals.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Approved Equal Clause/Substitutions/Options
- B. Certification
- C. Manufacturer's Instructions
- D. Shop Drawings
- E. Samples
- F. Material Safety Data Sheet (MSDS) Submittals
- G. Scheduling of Submittals
- H. Job Progress Schedule
- I. Progress Photographs
- J. Certificates
- K. Construction Waste Management Procedures and Certifications See Section 01 74 19.
- L. V.O.C. Compliance certification See individual technical sections.
- 1.03 APPROVED EQUAL CLAUSE/SUBSTITUTIONS/OPTIONS Section 01 25 00
- 1.04 CERTIFICATION
 - A. Certification of compliance with specification performance standards and manufacturers' specifications and directions shall be furnished for any portion of this work for which specific performance requirements and/or manufacturers' specifications are listed.

It shall be the responsibility of the Contractor to secure two (2) copies of each certification when required and transmit same to the Architect and designated representative of the Owner.

B. Sample Certification Form (2 pages) Section 01 33 06 is included in this manual. Each item requiring certification shall be so noted and affidavits shall be filed singly to cover each specified material, installation, application and the like.

CERTIFICATIONS SHALL BE SUBMITTED AS PART OF THE CLOSE OUT DOCUMENT REQUIREMENTS SET FORTH IN SECTION 01 77 00.

C. Decorations, Furnishings and Interior Finish - The Contractor's attention is directed to the New York State Fire Codes as it relates to regulations controlling decoration, furnishings and interior finishes as they affect the work of this Contract.

It is deemed the sole responsibility of the vendors furnishing fabrics, floor coverings, ceiling finishes, wall coverings and finishes and the like as covered by the regulations to submit applications and obtain approvals for same without additional charges to the Owner.

Failure to obtain, and submit, approvals in accordance with requirements <u>of this</u> <u>section will result in rejection</u> of any submittal for this phase of the work.

D. Packaged Equipment: Where packaged (factory assembled) mechanical and electrical equipment is furnished, a certificate shall be included with the submission of shop drawings or catalog data stating that the equipment complies with OSHA, National Electric Code, and applicable Underwriter's Laboratories Standards in respect to motor protection, grounding and protection against hazards, and is approved by all Regulatory Agencies.

1.05 MANUFACTURER'S INSTRUCTIONS

A. Where in these specifications an item is called for to be installed in accordance with the manufacturer's directions, specifications or recommendations, the Contractor shall furnish the Architect with two (2) printed copies of said directions, specifications or recommendations, before the item is installed.

1.06 SHOP DRAWINGS

- Submittals shall be made in groupings where installations are complementary, i.e. steel, steel decking, steel stairs, stair railings; roof systems/flashings; mechanical and electrical apparatus and the like. Failure to comply with this requirement will be cause for rejection of any or all submittals.
- The Contractor is encouraged to submit for approval products made from recycled and/or environmentally responsible material. Every effort will be made by the Design Professional Team to approve these materials; the substitution request procedure shall still be enforced.
- Where delegated design is specified in other specification sections or on the drawings the shop submittals must be stamped and signed by a NYS Licensed Design Professional

- A. The following serves as a further definition of the requirements for shop drawing submittals as covered in the Contract:
 - 1. The Contractor shall submit to the Architect with such promptness as to cause no delay in the work, layout, detail, schedule, setting, product data and shop drawings for each part of the work as specified or required.
 - a. Submission of data for review by the Structural and Mechanical/Electrical Engineers shall be sent directly to those Engineers with duplicate transmittals sent to the Architect.
 - 2. SUBMITTING ANY DATA FOR BEFORE APPROVAL, THE CONTRACTOR SHALL CHECK THE SUBMITTALS OF ALL CONTRACT **SUBCONTRACTORS** FOR ACCURACY AND COMPLIANCE. ALL SUBMITTALS SHALL BE UNDER THE COVER SHEET ATTACHED HERETO. SUBMITTALS NOT COMPLYING WITH THE ABOVE SHALL BE RETURNED TO THE SUBMITTING CONTRACTOR WITHOUT EXAMINATION BY THE ARCHITECT. Contractor shall see that all work contiguous with and having bearing on work indicated on drawings is accurately and distinctly illustrated and that work shown is in conformity with contract requirements.
 - 3. Shop drawings shall be numbered consecutively and shall represent:
 - a. All working and erection dimensions.
 - b. Arrangement and sectional views.
 - c. Necessary details, including information for making connections to other work.
 - d. Kinds of materials and finishes. Colors, where applicable
 - 4. Shop drawings shall be dated, and shall generally contain:
 - a. Name and Number of project.
 - b. Name, address and telephone number of submitting Contractor.
 - c. Description of required equipment, materials, and classification item numbers.
 - d. Locations at which materials or equipment are to be installed in the Work.
 - e. Identification of drawings, schedules, notes <u>and/or details and</u> <u>specification sections and</u> related paragraphs/articles to which they apply.
 - f. Equipment or fixture identification corresponding to that used in Contract Documents.
 - g. Accessories and special or non-standard features and materials which are being furnished.
 - h. Properly marked with external connection identification as related to the project where they consist of standard factory assembly or field installation drawings.

In addition to the general data required above, mechanical and electrical submissions shall contain:

a. Manufacturer's specifications including materials of construction, metal gauge, thickness and finish.

- b. Certified dimensional drawings including clearances required for maintenance or access
- c. Performance data, ratings, operating characteristics, and operating limits.
- d. Electrical ratings and characteristics.
- e. Wiring and control diagrams, where applicable.
- f. Certifications requested, including UL label or listing.
- g. List of accessories which are required but are NOT being provided by the product manufacturer or are NOT being furnished under this Section. Identify the Section(s) under which the accessories are being furnished.
- 5. Submission of data for approval shall be accompanied by letter of transmittal, in duplicate, containing the name of the project, Contractor's name, number of drawings, titles and other pertinent data.
- 6. Procedure for Submitting Shop Drawings and Product Data:

The contractor shall submit five (5) copies of data, for standard manufactured items, in the form of manufacturer's catalog sheets, showing illustrated cuts of the items to be furnished, scale details, sizes, dimensions, performance characteristics, operating clearances, capacities, wiring diagrams and all other pertinent information.

Two copies of reviewed submissions will be returned to the contractor.

For all other shop drawings, Contractor shall submit one transparency for each drawing until final approval is obtained.

Each drawing transparency shall have a clear space approximately 4 inches by 10 inches on the right-hand side for stamps showing "Date Received" and disposition of submittal.

In addition to the transparency, three (3) prints shall be required.

a. After completion of checking, the Architect, and Engineer (as appropriate) will retain one print for his record and return the transparencies to the submitting Contractor.

The average "turn-around time" of any one in-house submittal by the Architect shall not exceed 15 business days for review and at least 20 business days when another consultant is involved.

b. For drawings returned "Resubmit", "Revise & Resubmit", "Disapproved" or "Rejected-Resubmit", the original drawings shall be corrected, a new transparency made, and resubmitted until final approval.

<u>NOTE</u>: The Owner reserves the right to backcharge the Contractor for the additional costs beyond the review of any resubmittal as outlined in Section 01 25 00.

- c. For drawings returned "Approved", "No Exceptions Taken", "Approved as Noted", and "Make Corrections Noted", the Contractor shall obtain and provide sufficient prints as required for the field.
- 7. No work as called for by shop drawings shall be done until Architect's approval.
- 8. IF SUBMITTALS SHOW VARIATIONS FROM CONTRACT REQUIREMENTS BECAUSE OF STANDARD SHOP PRACTICES, OR OTHER REASONS, CONTRACTOR SHALL MAKE SPECIFIC MENTION OF SUCH VARIATION IN HIS LETTER OF TRANSMITTAL.
- 9. APPROVAL OF SHOP DRAWINGS IS GENERAL. IT SHALL NOT RELIEVE CONTRACTOR OF THE RESPONSIBILITY FOR ACCURACY OF SUCH DRAWINGS, NOR FOR THE FURNISHING OF MATERIALS OR PROVISION OF WORK REQUIRED BY THE CONTRACT AND NOT SHOWN ON THE SHOP DRAWINGS.

Unless it is an interpretation of design intent, approval of shop drawings shall not be construed as approval of departures from Contract.

- 10. If the Contractor should alter any information on previous submittals, besides the notations called for by the Architect, he must circle this new information to bring it to the Architect's attention.
- 11. Where practical, in submitting data for approval, all associated drawings, product data and the like, relating to a complete assembly <u>shall be submitted at one and the same time</u> so that each may be checked in relation to the entire proposed assembly.

PARTIAL SUBMISSIONS WILL BE RETURNED WITHOUT ACTION TAKEN.

EXTRANEOUS MATERIAL ON PRODUCT DATA SHEETS <u>SHALL BE</u> <u>STRUCK PRIOR TO SUBMITTAL</u>.

Resubmittals of any data shall be "complete", i.e. – Lighting Fixture resubmittal shall include all fixtures whether or not some have been approved so that when the entire submittal is approved, a full record copy is on file.

- 12. Contractor shall have copies of all approved shop drawings as listed in Paragraph 1.06.A.6 above on the job at all times and shall make them available to the Architect or the Owner's representatives.
- 1.07 SAMPLES
 - A. The following serves as a further definition of the requirements for sample submittals as covered in the Contract:
 - 1. Names of proposed manufacturers, materialsmen and dealers who are to furnish materials, fixtures, appliances or other fittings shall, where practical, be submitted to the Architect for early approval to afford proper investigation and check.

- 2. No manufacturer will be approved for any materials to be furnished under this contract unless he shall be of good reputation and shall have plant of ample capacity and shall have successfully produced similar products.
- 3. All transactions with manufacturers and subcontractors shall be through the Respective Prime Contractors.
- 4. Unless otherwise specified, samples shall be in duplicate (2) and of adequate size to show quality, type, color, range, finish, texture, etc.

INTERRELATED COLOR SELECTIONS <u>WILL NOT</u> BE MADE UNTIL ALL PERTINENT SAMPLES ARE MADE AVAILABLE TO ARCHITECT.

Deliver one (1) sample to field office and one (1) sample to Architect's office unless otherwise directed.

5. Each sample shall be labeled, bearing material and quality names, submitting Contractor's name, and project name, and other pertinent data.

In accordance with OSHA regulation Number 1910.1200, a Material Safety Data Sheet (MSDS) shall be submitted for each product to be incorporated in the work.

The sole purpose for requiring submittal of MSDS sheets as outlined herein and respective technical sections is to advise the General Contractor that health and safety is of primary importance to the execution of the work and for the future occupants of the project under construction. It is to be assumed, and will be enforced, that the submission of MSDS sheets be made as a separate package, covered by it's own transmittal and marked "for evidence of legal compliance". This submission will be noted and returned with a stamp indicating "SUBMITTED INFORMATION ONLY, NOT REVIEWED". Failure to observe these submittal requirements will be cause for rejection of the entire submittal.

The safe handling of products by the applicator according to MSDS warnings is a safety issue, like any other, entirely within the purview of the General Contractor.

6. Where Specifications require manufacturer's printed installation directions, such directions and diagrams shall accompany samples.

Coordinate with Paragraph 1.05 herein

- 7. A duplicate letter of transmittal from the submitting Contractor requesting approval of the sample shall accompany the samples.
- 8. Transportation charges to designated locations must be prepaid on all samples.
- 9. Materials shall not be ordered until approval is received in writing from the Architect.

All materials shall be furnished equal in all respects to the samples which were approved.

1.08 MATERIAL SAFETY DATA SHEET (MSDS) SUBMITTALS

- A. As specified in Paragraph 1.07 of this Section and within the technical sections forming this Specification, the Contractor is directed to the following requirements concerning "MSDS" submissions.
 - 1. Submit MSDS's for all products used during construction whether incorporated within the work or used in the performance of the work.
 - 2. Identify which products may be harmful to construction workers or other building occupants.
 - 3. Develop means and methods for protection of construction workers and other building occupants from potentially harmful products. <u>Submit said</u> <u>means and methods to the Owner for review and approval</u>.
- B. Further, the General Contractor with assistance from each individual contractor shall maintain a "MSDS" file on site, accessible to workers and otherwise in compliance with jurisdiction's "Right To Know" legislation.
- C. Attention is directed Section 01 77 00, Article 1.04.A.12 for final closeout submittal of MSDS compilation to the Owner.

1.09 PROGRESS PHOTOGRAPHS

- A. This Article includes requirements for periodic construction photography by the General Contractor, utilizing digital camera equipment, to demonstrate construction progress and to serve as a communicative device when describing a given condition to others at a remote location, by means of the internet.
- B. Photography shall be taken using a digital camera and electronic program which will download the digital photos in a JPEG format to a computer with resolution adequate to demonstrate the item under discussion.
- C. One set of record prints will be required and filed with the monthly requisition. The JPEG files shall be transmitted to the appropriate parties who shall then have the option to view the picture(s) on screen or print them out using their own equipment.
- D. It is the intention of this Section to provide a tool to enhance communications and reduce the amount of time required to address questions arising at the Project site. In this end, the Contractor shall utilize good judgment in providing photographs that are informative, and not merely repeating what is shown in the other photographs.
- E. Provide factual representation of construction extent and conditions. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion, utilizing a normal lens.
- F. Before starting work, the General Contractor shall take photographs of the site and the building interiors from different points of view sufficient in number to show all present conditions.
- G. The minimum requirements, per requisition period are twelve (12) total (six (6) photographs of each of the Building units and six (6) interior views), and three (3) photographs of the Site Work, from different points of view designated by the Architect
- 1.11 CERTIFICATES
 - A. Submit a Summary of Solid Wastes Generated, manifests, weight tickets, and the like in accordance with requirements of Section 01 74 19 Construction Waste Management.
 - B. Submit, as required by each technical section a certification for V.O.C. compliance.

Address:	Telephone: ()
Owner:	
Name of Project:	
TYPE OF SUBMITTAL: Shop Drawings Technical Data Test Report	SchedulePhysical SampleCertificateColor SampleWarranty
Submission #: 1 st 2 nd 3	rd 4 th (circle one)
Description:	
Product Identification:	
N /	
	NT REFERENCES: (Must be fully filled out)
Spec Section No.:	Drawing No(s):
Paragraph:	Rm. Or Det. No(s):
Contractor Remarks:	Contractor Submittal Review Stamp
	THE ATTACHED MATERIAL HAS BEEN REVIEWED BY THE UNDERSIGNED AND IS BELIEVED TO COMPLY WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE UNDERSIGNED UNDERSTANDS VERIFICATION OF FIELD DIMENSIONS, AND COORDINATION WITH OTHER TRADES, REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
	DATE: BY (SIGN):
Consultant use below this line:	Architect Submittal Review Stamp
	NO EXCEPTIONS MAKE CORRECTIONS NOTED REJECTED REVISE AND RESUBMIT EXAMINED SUBMIT SPECIFIED ITEM
	CHECKING IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. ANY ACTION SHOWN IS SUBJECT TO THE REQUIREMENTS OF THE PLANS & SPECIFICATIONS CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS WHICH SHALL BE CONFIRMED & CORRELATED AT THE JOB SITE; FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION COORDINATION OF HIS WORK WITH THAT OF ALL OTHER TRADES & THE SATISFACTORY PERFORMANCE OF HIS WORK
	KG+D ARCHITECTS, P.C.
	DATE: BY:

Kaeyer, Garment + Davidson Architects, PC

285 Main Street, Mount Kisco, New York 10549 914.666.5900 kgdarchitects.com

CONTRACTOR REQUEST FOR ELECTRONIC DRAWING FILES

The Architect, for the convenience of the Client/Owner, has electronic copies or representations of Drawings, Specifications and Project Manuals. Requests for electronic copies of such Drawings, Specifications and Project Manuals by the Contractor, for the Contractors use or the use of Subcontractors, shall be made in writing to the Client/Owner as outlined hereinbelow and shall outline the benefit derived from such a request. The Contractor shall be prepared to reimburse the Client/Owner for any costs involved in preparing such electronic documents for the Contractors use.

Architect's Project Number:	
Project Name:	
Architect:	
Client/Owner:	
Contractor/Recipient's Name:	
Attention to:	
Contractor/Recipient's Address:	
Date of Request:	
Date of Release:	

As requested, attached is a list of electronic drawing files in DWG/DWF format (Drawings may be compressed). For the release of these electronic drawing files to the recipient, the following items shall be understood, acknowledged and signed by the authorized personnel of the recipient with the fee included as may be required.

- A. The electronic drawing files are the property of the Architect and the Contractor is granted a license to use the electronic files only in connection with the subject project.
- B. The electronic drawing files do not necessarily represent the Contract Documents associated with the referenced project. These files are solely for the use of the recipient and are not a representation of the scope of work for the project. Any use by contractors, subcontractors or fabricators shall be on all of the same terms and conditions being applicable to such users who shall acknowledge the same in writing. The Recipient may use the electronic drawing files only. Electronic drawing files or portions thereof, shall not be provided to anyone else without the written approval of the Client/Owner. The use of the electronic drawing files, documents and any reprographics shall not identify any member of the Architect or Architect's consultants or subconsultants or the Client/Owner without the written approval from the parties.
- C. The entire risks as to the results and performance of the package including the electronic drawing files, are assumed by the Contractor/recipient. The Client/Owner, the Architect and the Architect's consultants and sub-consultants, including directors, employees, representatives, and licensors of the company, shall not have any liability to the Contractor/recipient or any other person or entity for any direct, indirect, incidental special or consequential damages whatsoever, including, but not limited to, the loss of revenue or profit, lost data, or any other personnel, commercial or economic loss, and claims by third parties. Even if the Client/Owner and Architect and the Architect's consultants and sub-consultants has been advised of the possibility of such damages; said Client/Owner and Architect and the Architect's consultants shall not be held liable as stated above.
- D. The Contractor/recipient hereby agrees to indemnify and hold the Client/Owner, the Architect and the Architect's consultants and sub-consultants harmless from and against any cost, damage, liability, loss or claim arising from violation of this license. The Contractor/recipient and all

subcontractors of all tiers also agrees that, in addition to all other remedies hereunder, the Contractor/recipient and such parties grant the Client/Owner the right to seek injunctive or other equitable relief to prevent the violation or require the performance of any of the Contractor's/recipient's obligations under this license, and the Contractor/recipient hereby consents to the issuance of such relief by any court of competent jurisdiction without the need to post any bond or security.

E. The electronic files requested are as follows:

Electronic file name	Corresponding Drawing
	(close approximation)
1.	
2.	
3.	
Etc.	
Total number of files:	
Total Fee: US\$	

CONTRACTOR'S/RECIPIENT'S AGENT SIGNATURE: _____

NAME IN BLOCK LETTERS: ______

AUTHORIZED POSITION HELD:

DATE OF SIGNATURE: _____

End of Attachment

I/WE, the MANUFACTURER/SUPPLIER and INSTALLER of
--

as specified in Section Number ______ of the Contract Documents prepared by Kaeyer Garment + Davidson Architects, PC; 285 Main Street; Mt. Kisco, NY 10549 for

Middle School/High School Reconstruction Tuckahoe Union Free School District 65 Siwanoy Blvd. Eastchester, NY 10709

do (does) herein certify that -

- 1. All materials furnished for said project do fully comply with all specification requirements as stated within the Contract Documents;
- 2. That no asbestos containing materials of any nature are used in the work;
- 3. That execution of the Work covered by this certification has been performed in accordance with the drawings prepared by the design professional team.

CONTRACTOR:	
CERTIFICATION BY:	TITLE:
ADDRESS:	
CERTIFICATION DATED:	
Distribution:	
Original and One Copy to:	Kaeyer, Garment + Davidson Architects, PC 285 Main Street Mt. Kisco, NY 10549
One Copy to:	To Be Issued at Pre-Construction Meeting

CERTIFICATION OF SPECIFICATION COMPLIANCE

On the ______ day of _____, before me came ______ to me known and who by me being duly sworn did depose and say that he resides at ______ that he is the officer of the said corporation executing the foregoing instrument, that he knows the seal of said corporation, that the seal affixed to said instrument is such corporate seal, that it was so affixed by order of the Board of Directors of said corporation and that he signed his name thereto by like order.

)SS.)

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partnership.

Notary Public

HEALTH AND SAFETY PLAN

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Provide all labor, equipment and materials and perform all operations in connection with monitoring air quality, decontaminating equipment and providing worker health and safety protection for all Contractor and Subcontractor personnel.
- B. Develop a site specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered. This plan shall meet all Occupational Safety and Health Administration (OSHA) requirements.
- C. Review the requirements and data presented and supplement the program with any additional measures deemed necessary to fully comply with regulatory requirements and adequately protect personnel on the site.
- 1.03 REFERENCES
 - A. OSHA Regulation 29 CFR 1910.120
 - B. OSHA Regulation 29 CFR 1926.62
- 1.04 DEFINITIONS
 - A. Site Safety Official (SSO): The individual who is responsible to the Contractor and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.
 - B. SSO shall possess full and complete authority to order stoppage of any work which he deems unsafe.
- 1.05 SUBMITTALS
 - A. Provide within seven (7) days after execution of the Agreement.
 - 1. Site-specific HASP including the Emergency Response Plan to the Owner, Construction Manager and Architect for review, including provisions for decontamination and a contingency plan for unforeseen emergencies. The review is only to determine if the HASP meets basic regulatory requirements and the minimum requirements of this Section. The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.
 - 2. Current certification of employee's health and safety training and certification of employee's baseline medical exam status.
 - 3. Certification of additional required health and safety training for Supervisors.
 - 4. Qualifications and experience of the SSO for approval.
 - B. Submit minutes of weekly safety meetings at periodic progress meetings.

C. Refer to related submittal requirements in Section (s) 02 82 00 - Asbestos Abatement for project.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor is solely responsible for the health and safety of workers employed by the Contractor, any Subcontractor and anyone directly or indirectly employed by any of them.
- B. Develop and follow a site specific Health & Safety Plan (HASP) in accordance with the requirements of paragraph 1.07.
- C. Provide a full-time SSO regardless of whether or not the Work is at a defined Uncontrolled Hazardous Waste Site.
- D. Pre-arrange emergency medical care services at a nearby hospital, including establishment of emergency routes of travel.
- E. Meetings:
 - 1. Conduct daily job briefings with all site personnel to discuss relevant health and safety issues including but not limited to hazards, monitoring, procedures and controls. Document attendance and topics covered.
 - 2. At a minimum, conduct weekly safety meetings with all site personnel, documenting attendance and topics covered.
- F. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR 1910.120.
- G. Include those workers involved with the abatement of Asbestos containing materials in a medical surveillance program and respiratory protection program that meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134, respectively.
- H. In areas where contaminated media are likely to be encountered, monitor air quality in and around work area using appropriate air monitoring equipment/analysis, as indicated in Part 2. Record all readings and maintain record on site. Stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded. Ensure that degree and type of respiratory protection provided is consistent with the monitored concentrations and individual chemical parameters. Lawfully dispose of all contaminated clothing and equipment that cannot be decontaminated.

1.07 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

- A. The following items shall be addressed in the HASP:
 - 1. safety and health hazard assessment;
 - 2. procedures for emergency medical treatment and first aid;
 - 3. map indicating route to hospital for emergency medical care;
 - 4. Lead Exposure Control Plan (29 CFR 1926.62);
 - 5. equipment decontamination procedures;
 - 6. air monitoring procedures and action levels;
 - 7. personal protective equipment and decontamination;
 - 8. physical hazard evaluation and abatement including:
 - a. equipment operation;
 - b. confined space entry;
 - c. slips and falls;
 - d. building collapse;
 - e. falling debris;

- f. encountering unmarked utilities;
- g. cold and heat stress;
- h. hot work (cutting and welding);
- i. excavation entry;
- 9. training requirements;
- 10. recordkeeping requirements;
- 11. emergency response plan that includes:
 - a. names of three (3) Emergency Response Contractors, experienced in the removal and disposal of oils and hazardous chemicals, that the Contractor intends to use in the event of an emergency;
 - b. evacuation routes and procedures;
 - c. emergency alerting and response procedures.

1.08 CONTINGENCY MEASURES & NOTIFICATIONS

- A. The potential for encountering hazardous buried objects or materials that could pose a threat to human health or the environment exists at the Project Site. In the event that potentially hazardous materials are encountered during the work under this contract, the responsibilities of the Contractor and the Construction Manager are described herein.
- B. The procedures and protocols to be used by the SSO in defining materials that are potentially hazardous include screening with a photoionization detector, odor, visual appearance of a material, and obvious oil or chemical contaminated materials.
- C. Upon encountering suspected hazardous buried objects or materials as described above, cover the excavation immediately if no imminent danger, as defined by the SSO, is present. If there is an imminent danger, as defined by the SSO, evacuate the area immediately. The SSO shall then notify the Construction Manager of the situation.
- D. Establish, properly barricade, and mark the area as an exclusion zone under the direction of the SSO. The SSO shall establish the exclusion zone boundaries based upon air quality monitoring using a photoionization detector and other equipment as appropriate. The exclusion zone shall be established at a minimum 50-foot radius around the location where the potentially hazardous material is encountered. Work within the exclusion zone shall be discontinued until the hazardous condition has been remediated and testing indicates that a hazard does not exist. Other activities of the site, outside the limits of the exclusion zone shall continue. Ambient air quality monitoring shall be performed by the SSO to demonstrate that ambient air quality in other portions of the site is not adversely impacted by the exclusion zone condition.
- E. Notify Construction Manager regarding the presence of potentially hazardous materials. Construction Manager may direct the Contractor to notify regulators and to obtain necessary regulatory approvals for remediation.
- F. Mobilize the appropriate equipment and personnel to sample and test the hazardous material within the exclusion zone to determine the remedial action required, subject to the Construction Manager's direction. Contractor may be directed to remove and legally dispose of the material. Compensation for the removal and disposal of hazardous material will be as a Change in Work and Change in Contract Price in accordance with the Subcontract Agreement, if not covered under a specific bid item.

Part 2 - PRODUCTS

2.01 AIR MONITORING EQUIPMENT

- A. Provide and maintain portable photoionization detector or organic vapor analyzer capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 PPM level.
- B. Provide and maintain an oxygen analyzer to measure oxygen concentration in any trench or confined space prior to entry, as determined by the SSO.
- C. Provide and maintain an explosimeter whenever the potential for accumulation of explosive gases exists, as determined by the SSO.
- D. Provide and maintain air monitoring equipment as required for the collection/monitoring of airborne asbestos fibers. All air samples related to abatement work shall be analyzed by a laboratory accredited by the American Industrial Hygiene Association.
- E. All air monitoring equipment shall remain the property of the Contractor.

Part 3 - EXECUTION - NOT USED

PERMITS AND COMPLIANCE

Part 1 - GENERAL

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" that may be involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Preconstruction Meeting
- B. Permits and Licenses
- C. Compliance
- D. Additional Compliance

1.03 PRECONSTRUCTION MEETING

A. After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Construction Manager and Architect to discuss the applicable environmental regulations and requirements; coordinate with Sections 01 57 13, 01 57 19 and 01 74 19.

1.04 PERMITS AND LICENSES

- A. The Contractor shall obtain, maintain and pay for all permits and licenses necessary for the execution of the work and for the use of such work when completed.
- B. 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 environmental regulations bearing on performance of the Work.
- 1.05 COMPLIANCE
 - A. The Contractor shall give all notices, pay all fees and comply with all laws, rules and regulations applicable to the work.
- 1.06 ADDITIONAL COMPLIANCE
 - A. The Contractor, Subcontractors, and the employees of the Contractor and Subcontractors, shall comply with all regulations governing conduct, access to the premises, operation of equipment and systems, and conduct while in or near the premises and shall perform the work in such a manner as not to unreasonably interrupt or interfere with the conduct of business of the Facility.
 - B. Further, attention is directed to requirements of Section 01 15 01.

Part 2 – PRODUCTS

Part 3 - EXECUTION

CODES AND STANDARDS

Part 1 - GENERAL

1.01 QUALITY ASSURANCE

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- 1.02 REFERENCE STANDARDS The abbreviations, which may be used in the construction specifications, refer to the organizations and specifications of the organizations listed below.

AABC	Associated Air Balance Council
ABMA	American Boiler Manufacturers Association
AISC	American Institute of Steel Construction
ADC	Air Diffusion Council
AMCA	Air Movement and Control Association
ASC	Adhesive and Sealant Council
ASLA	American Society of Landscape Architects
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.
ASTM	American Society for Testing and Materials International
CLFMI	Chain Link Fence Manufacturers Institute
CRI	Carpet and Rug Institute
CS	Commercial Standard of NBS
GANA	Glass Association of North America
GS	Green Seal
IEEE	Institute of Electrical and Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IGMA	Insulating Glass Manufacturers Alliance
LSGA	Laminators Safety Glass Association
NAIMA	North American Insulation Manufacturers Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NPCA	National Paint and Coatings Association
NPA	National Particleboard Association
NSF	National Sanitation Foundation International
RFCI	Resilient Floor Covering Institute
SFPA	Southern Forest Products Association

SIGMA	Sealed Insulating Glass Manufacturers Association
SPC	Southern Pine Inspection Bureau (Grading Rules)
SSPC	Steel Structures Painting Council
WDMA	Window & Door Manufacturers Association
WRI	Wire Reinforcement Institute, Inc.
WSFI	Wood and Synthetic Flooring Institute
WWPA	Woven Wire Products Association

B. Federal Agencies:

CE	Army Corps of Engineers)
CPC	Consumer Product Safety Commission
EPA	Environmental Protection Agency
DOE	Department of Energy
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration

Part 2 - PRODUCTS

NOT USED

Part 3 – EXECUTION

NOT USED

TESTING LABORATORY SERVICES

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.
- D. Pursuant to the provisions of Section 01 33 00, Submittal Requirements, it is further required that unless otherwise specified, tests called for in the Specifications applicable to the work and/or required to implement the work shall be paid for by the Owner.
- E. Where tests are required by the Architect to substantiate conformance to the specifications the Owner will pay all costs of such tests and engineering services unless said tests indicate that the workmanship or materials used by the Contractor are not in conformance with the Drawings, Specifications, Approved Shop Drawings or the approved materials. In such event, the Contractor shall pay for the tests, remove all work and material so failing to conform, REPLACE with work and materials which are in full conformity.
- F. Requirements related to testing services and specified elsewhere in these documents include:
 - 1. Inspections and testing as required by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction over the work.
 - 2. Certification of compliance as required by individual specification sections.
 - 3. Testing, adjusting and balancing of mechanical equipment and systems.
 - 4. Project record documents, including operation and maintenance manuals, record drawings and the like.
 - 5. Subsurface exploration records.
 - 6. Tests and standards governing work and/or materials as may be specified throughout these specifications and/or as shown on the drawings.
- G. The Owner will employ, and pay for, the services of a Special Inspector to perform Special Inspections and Tests in accordance with requirements of Chapter 17 of the Building Code of New York State (BCNYS). Refer to Division 01 Section Special Inspections and Tests" for further information
- H. Inspection, sampling and testing is required for the following,
 - Soils materials and compaction.
 - Paving systems.
 - Concrete, formwork, reinforcing and the like.
 - Structural steel systems, light metal framing and the like.
 - □ Welding
 - Masonry and mortar.
 - Roofing and flashing systems

however this listing is to be considered as <u>partial</u> only with the burden placed on the Contractor to advise, and the Laboratory to provide, all such inspections, sampling and testing as may be specified and/or required by these Contract Documents and

the applicable laws and ordinances of the jurisdiction.

I. Employment of the Testing Laboratory shall not relieve the Contractor of his obligation to perform Work in accordance with the Contract.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Laboratory Qualifications
- B. Laboratory Duties
- C. Contractor's Responsibilities
- D. Tests Required

1.03 LABORATORY QUALIFICATIONS

- A. Laboratory shall meet -
 - 1. The "Recommended Requirements for Independent Laboratory Qualifications", latest edition as published by the American Council of Independent Laboratories.
 - 2. Basic requirements of ASTM E 329, latest edition, governing "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".
- B. Laboratory shall submit copy of inspection of facilities as made by Materials Reference Laboratory of the National Bureau of Standards during most recent tour of inspection; with memorandum of remedies of any deficiencies reported by inspection.
- C. Testing equipment shall be calibrated at maximum 12 month intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants; submit copy of certificate of calibration as executed by an accredited calibration agency.

1.04 LABORATORY DUTIES

- A. Cooperate and coordinate with Architect and Contractor. Provide qualified personnel promptly upon notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction in conformance with specified standards, recognized authorities and the like so as to ascertain compliance with the requirements of the Contract Documents.
- C. Promptly notify Architect and Contractor of irregularities or deficiencies of Work which are observed during performance of services.
- D. Promptly submit sufficient written reports and tests to Architect for distribution. Reports shall contain -
 - 1. Issue date
 - 2. Project title and number
 - 3. Testing laboratory name and address
 - 4. Name and signature of inspector
 - 5. Date of inspection or sampling
 - 6. Temperature and weather observations
 - 7. Test date
 - 8. Identification of product and specification section
 - 9. Location in project
 - 10. Type of inspection or test
 - 11. Observations regarding Contract Document compliance.

- E. Perform additional services as required by the Owner and/or Architect.
- F. The laboratory is not authorized to release, revoke, alter or enlarge on, requirements of the Contract Documents; approve or accept any portion of Work; perform any duties of the Contractor.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall to the best of his ability -
 - 1. Cooperate with laboratory personnel, provide access to the Work and to Manufacturer's operations as may be necessary.
 - 2. Provide to the laboratory preliminary representative samples of materials to be tested in required quantities.
 - 3. Furnish copies of mill test reports.
 - 4. Provide casual labor and facilities as required to provide access to Work to be tested; to obtain and handle samples at the Site; to facilitate inspections and tests; for laboratory's exclusive use for storage and curing of test samples.
 - 5. Notify laboratory sufficiently in advance of operations to allow for his assignment of personnel and scheduling of tests.
 - 6. Arrange with laboratory and PAY FOR, additional sampling and testing required for the Contractor's convenience.
 - 7. Employ, AND PAY FOR, services of a separate, equally qualified Independent Testing Laboratory to perform additional inspections, sampling and testing required when initial tests indicate Work does not comply with Contract Documents. Coordinate with Paragraph 1.05.A.4 above.

SECTION 014329 - SPECIAL INSPECTIONS AND TESTS

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes administrative and procedural requirements for performing Special Inspections and Tests in accordance with requirements of Chapter 17 of the *Building Code of New York State* (BCNYS). Testing and inspecting services are required to verify compliance with requirements specified or indicated in the contract documents. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
- 1.2 DEFINITIONS
 - A. Registered Design Professional: The Registered Architect whose seal appears on the Construction Drawings.
 - B. Testing/Inspecting Agency: An agent retained by the Owner and coordinated by the Special Inspector, to perform some of the testing and/or inspection services on behalf of the Special Inspector. (An example of an Inspecting Agency would be a Geotechnical Engineer).
 - C. Statement of Special Inspections: A document prepared by the Registered Design Professional that includes the Schedule of Special Inspections listing the materials and work requiring Special Inspections. A copy of this document is included at the end of this Section.
 - D. Continuous Special Inspection: The full-time observation of work requiring Special Inspections by the Special Inspector who is present in the area where the work is being performed.
 - E. Periodic Special Inspections: The part-time or intermittent observation of work requiring Special Inspections by the Special Inspector who is present in the area where the work has been or is being performed and at the completion of the work

1.3 CONTRACTOR RESPONSIBILITIES

- A. Contractor shall cooperate with the Special Inspector and his agents so that Special Inspections and testing may be performed without hindrance.
- B. Contractor shall notify the Special Inspector and/or Testing/Inspecting Agency at least 48 hours in advance of a required inspection or test. Contractor shall coordinate sequence of activities to accommodate required inspection and testing 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.
- C. The Contractor shall provide incidental labor and facilities to provide access to the work to be inspected or tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
- D. The Contractor shall keep at the project site the latest set of Construction Drawings, field sketches, accepted shop drawings, and specifications for field use by the Inspectors and Testing Technicians.
- E. The Special Inspection program shall in no way relieve the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents or from implementing an effective Quality Control program.
- 1.4 QUALITY CONTROL
 - A. Construction Manager will hold a Special Inspections preconstruction meeting at least 7 days prior to the initial planned date for start of construction.
 - 1. Discussion shall include review of specifications and Schedule of Special Inspections for work requiring Special Inspections; responsibilities of Contractor, Owner, Testing Agency, Special Inspector, and Registered Design Professional; notification procedures; and reporting procedures.
 - 2. Attendees shall include the Contractor, Owner's representative, Testing Agency, Special Inspector, and Registered Design Professionals for Structural Engineering and for Architecture.
- 1.5 LIMITS ON AUTHORITY
 - A. The Special Inspector or Testing/Inspecting Agency shall not release, revoke, alter, or enlarge on the requirements of the Contract Documents.
 - B. The Special Inspector or Testing/Inspecting Agency shall not have control over the Contractor's means and methods of construction.
 - C. The Special Inspector or Testing/Inspecting Agency shall not be responsible for construction site safety.
 - D. The Special Inspector or Testing/Inspecting Agency shall not have the authority to stop the work.
- 1.6 STATEMENT OF SPECIAL INSPECTIONS
 - A. The Statement of Special Inspections and Tests, on the form included at the end of this Section, will be prepared by the Registered Design Professional.

31 March 2022 66-03-02-03-0-002-024 Construction Documents

B. Required inspections and tests are described in the Schedule of Special Inspections and Tests attached to the end of this Section and in the individual specification sections for the items to be inspected or tested .

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used).

END OF SECTION 014329 ATTACHMENTS SPECIAL INSPECTION NON-CONFORMANCE REPORT FORM NYSED STATEMENT OF SPECIAL INSPECTIONS AND TESTS

SPECIAL INSPECTION NON-CONFORMANCE REPORT NO.

DATE:								
TO:	Registered Design Professional (RDP) Kaeyer, Garment& Davidson Architects, PC 285 Main St., Mount Kisco, NY 10549 Fax: (914) 666-0051							
CC:	Contractor:	Contractor:						
FROM:	, Special Inspector							
PROJECT:	Tuckahoe Middle School/ High School Reconstruction KG&D Project #2021-1053							
PART I: REFEREN	ICE SPECIAL INSPECTION REPORT NO.							
	NON-CONFORMANCE: (PROVIDE ATTACHMENTS IF NECESSARY)	h copy of report.)						
RDP SIGNATURE	DATE							
IS REINSPECTION	N BY SPECIAL INSPECTOR REQUIRED UYES UNO							
	CTOR VERIFICATION (To be completed by either the [General lanager] or Subcontractor and returned to the Special Inspector							

RDP.)

I verify that as of the date listed, the non-conforming item noted above has been corrected as required.

SIGNATURE	DATE

FP-SS	I BCNYS 2020						page 1 of 5		
NYS EDUCATION DEPARTMENT Office of Facilities Planning 89 Washington Avenue, Room 1060 EBA Albany, NY 12234				STATEMENT OF SPECIAL INSPECTIONS AND TESTS As required by the Building Code of NYS (BCNYS)					
			As required by the Building (b (BCN I	.5)			
BCN	YS § 1704.1.1 requires the project I	Design P	rofession	al to complete the Statement of	of Special In	spection	s and Tests. Completion of		
the St	atement of Special Inspections & Te	sts and s		-	-	-	-		
is a co	ondition for issuance of the Building	Permit.							
	ol District				Building				
	ahoe UFSD				Middle Sch	ool/ Hig	h School		
	ct Title hoe Middle/High School Reconstruc	ction 202	21						
	Project #	202		Project Add	ress				
	-02-03-0-002-024			65 Siwanoy	Blvd Eastel	nester, N	Y 10709		
	tect/Engineer D Architects, P.C. / The DiSalvo Eng	ineerino	Group						
	of Person Completing this Statemer		, oroup		Phone		Date		
Comn	nents								
			I			1	Ι		
	ECTION AND TESTING inuous & Periodic is as Defined by CNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY		
А.	Steel Construction								
1.	Material verification of high- strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1705.2	√	051200		
2.	Inspection of high-strength bolting.	Х	X	AISC 360, Section M5.6-3	1705.2	7	051200		
3.	Material verification of structural steel.			AISC360 Ch. N	1705.2	~	051200		
4.	Material verification of weld filler materials.			AISC 360, Ch. N	1705.2		051200		
5.	Inspection of welding:				1705.2				
	a. Structural steel	Х	X	AISC360 Table N5.4-1	1705.2		051200		
	b. Reinforcing steel	Х	X	AISC360 Table N5.4-1	1705.2				
6.	Inspection of steel frame joint details.		Х	AISC360 Table N6.1	1704.3, 1704.3.2	7	051200		
B.	Concrete Construction								
1.	Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 20,25.2, 25.3, 26.6.1-26.6.3	175.3 1908.4		051200		
2.	Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 26.6.4	1704.4				

CONTINUOUS **BCNYS REFERENCE REFERENCE** STANDARD **IDENTIFY SPEC** CHECK IF REQUIRED INSPECTION AND TESTING PERIODIC SECTION AND PROVIDE (Continuous & Periodic is as Defined by **CLARIFYING NOTES IF** the BCNYS) NECESSARY Х Inspection of bolts to be installed Ch. N: Section N5.6 and 1705.3 033000 3. in concrete prior to and during Tables N5.6-1, N5.6-2 and \checkmark placement. N5.6-3 Х 033000 Verify use of required design mix. ACI 318: Ch. 1904.1 4. 19,26.4.3,26.4.4 1904.2 \checkmark 1908.2 1908.3 Х ASTM C 172, C 31; ACI 1908.9 033000 Sampling fresh concrete: slump, 5. \checkmark air content, temperature, strength 318: 5.6, 5.8 test specimens. 6. Inspection of placement for proper Х ACI, 318: 26.5 1904.1 033000 1904.2 application techniques. \checkmark 1908.2 1908.3 7. Inspection for maintenance of Х ACI, 318: 26.5.3-26.5.5 1908.9 033000 \checkmark specified curing temperature and techniques. 1705.2 Inspection of prestressed concrete. Х ACI 318: 18.18.4, 18.20 8. Erection of precast concrete Х ACI 318: Ch. 26.8 1705.3 9. members. Verification of in-situ concrete Х ACI 318:26.11..2 1705.3 10. strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs. 11. Inspection of formwork Х ACI 318: 26.11.2 1705.3 033000 \checkmark C. Masonry Construction ACI 530/ ASCE ACI 530.1/ 1705.4 L1 = Level 1 Inspection required 042000 5/TMS 402, Ch. ASCE for nonessential facilities. \checkmark 35 6/TMS 602, Ch. 35 ACI 530/ ASCE ACI 530.1/ 1705.4 L2 = Level 2 Inspection required for essential facilities. In 5/TMS 402, Ch. ASCE general, schools are not 35 6/TMS considered essential 602, Ch. 35 facilities unless they are a designated emergency shelter

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(Cont		ND TESTING Periodic is as Defined by	CONTINUOUS	PERIODIC	REFERENCE STANDARD		BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1.	Verify to	ensure compliance:							
	a. Pro	oportions of site prepared ortar and grout.		L1 & L2	Table 3.1.2.2.a. Table 3.1.2.3.d.	2.1, 2.6A, 2.6B	1705.4	~	042000
		acement of masonry units d construction of mortar nts.		L1 & L2	Table 3.1.2.4.a	3.3F	1705.4	~	042000
	rein	cation and placement of nforcement, connectors, dons, anchorages.		L1	Section 1.13 Table 3.1.2.2.d.; Table 3.1.2.3.c.	3.2E, 3.4	7105.4	~	042000
				L2	Sec. 1.13	3.4, 3.6A	7105.4		
	d. Pre	estressing technique.		L1			7105.4		
		out space prior to buting.	L2				1705.4		
	e. Gra pre	ade and size of estressing tendons and chorages.		L1			7105.4		
		acement of grout.	L2				7105.4		
		out specs prior to outing.	L2				7105.4		
2.	-	n program shall verify:							
		e and location of uctural elements.		L1 & L2		3.3F	1705.4	\checkmark	042000
		pe, size, and location of chors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6		1705.4	~	042000
	-	ecified size, grade, and be of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4	1705.4	~	042000
	d. We bar	elding of reinforcing rs.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)		7105.4		
		ld/hot weather protection masonry construction.		L1 & L2	Table 3.1.2.4.d	1.8C, 1.8D	1705.4	~	042000
	me	estressing force asurement and blication.	L2	L1		3.6B	7105.4		
3.		on prior to grouting.		L1	1.13		1704.5	~	042000
			L2			3.2D, 3.4, 2.6B, 3.3B 1.4	1704.5 2105.2.2, 2105.3		
4.	Grout pla	cement.	L1		Table 3.1.2.3.a Table 3.1.2.1.f	3.2D, 3.2F, 3.5	1705.4	~	042000

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(Cont	ECTION AND TESTING inuous & Periodic is as Defined by CNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD		BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5.	Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2				1705.2		
6.	Compliance with documents and submittals.		L1 & L2	Table 3.1.2.4.a 3	.3F	1705.4		
D.	Wood Construction							
1.	Fabrication process of prefabricated wood structural elements and assemblies.					1704.2.5		
2.	High-load diaphrams designed in accordance with Table 2306.3.2			Table 2306.2		1705.5		
E.	Soils					1705.6	\checkmark	312000
F.	Pile Foundations					1705.7		
G.	Pier Foundations					1705.8		
H.	Sprayed Fire-Resistant Materials	5						
1.	Structural member surface conditions.					1705.14.2		078100
2.	Application.					1705.14.3		078100
3.	Thickness.			ASTM E 605		1705.14.4		078100
4.	Density.			ASTM E 605		0705.14.5		078100
5.	Bond strength.			ASTM E 736		1705.14.6		078100
I.	Mastic and Intumescent Fire-Res	sistant Co	oatings			1705.15		078123
J.	Exterior Insulation and Finish Sy	ystems (1	EIFS)			1705.16		
К.	Special Cases					1705.17		
L.	Smoke Control		1705.18					
М.	Special Inspections for Seismic R	esistance	e					
1.	Structural steel.	X		AISC 341		1705.12.1		
2.	Structural wood.	Х				1705.12.2		
3.	Cold-formed steel framing.		Х			1705.12.3		
4.	Pier Foundations.		Х			1705.8,170 5.12		
5.	Storage racks and access floors.		Х			1705.12.5, 1705.12.7		

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INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)		CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6.	Architectural components.		Х		1705.12.5		
7.	Mechanical and electrical components.		Х		1705.12.6		
8.	Designated seismic system verifications				1705.13.3		
9.	Seismic isolation system.		Х		1705.13.4		
N.	Structural Testing for Seismic Re	esistance					
1.	Testing and verification of masonry materials and assemblies prior to construction.				1705.13.2		
2.	Testing for seismic resistance.				1705.13		
3.	Reinforcing and prestressing steel.			ACI 318	1705.13		
4.	Structural steel.			AISC 341, AWS D1.1	1705.13		
5.	Seismic qualification of mechanical and electrical equipment.				1705		
6.	Seismically isolated structures.			Section 17.8 of ASCE 7	1705.13.4		
0.	Structural Observations						
1.	Seismic resistance.				1704.6		
2.	Wind requirements.				1704.6		
P.	Test Safe Load	1707	▏┣┫				
Q.	In-Situ Load Tests	1708					
R.	Preconstruction Load Tests				1709		
S.	Other (list)						

TEMPORARY FACILITIES

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. In general this Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.
- C. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- D. Provide environmental protection as required by authorities having jurisdiction and as indicated in the Contract Documents.
- E. Refer to the Construction Implementation Plan comprising Section 011001 for related information on temporary facilities and utilities

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Field Office
- B. Temporary and Permanent Services, General
- C. Temporary Light and Power
- D. Temporary Heating/Cooling Facilities
- E. Temporary Toilet Facilities
- F. Temporary Water
- G. Storage Facilities
- H. Scaffolding and Staging
- I. Construction Fencing and Barriers See drawings for location of construction fencing. Barriers shall be constructed of steel studs and fire rated gypsum with level 1 tape finish. Fire safe all temporary partitions.
- J. Janitorial Service/Daily Cleanup
- K. Burning
- L. Dust Control
- M. Fire Prevention Control
- N. Temporary Fire Protection
- O. Discontinuance, Changes and Removal
- 1.03 FIELD OFFICE
 - A. The General Contractor, until all the work covered by the Contract is accepted by the Owner, shall provide a temporary office structure, with sanitary facilities, prior to the commencement of work of any Prime Contractor at the project site, for the use of the Construction Manager and for project meeting space.
 - B. Construction Manager Field Office: Provide a separate insulated, weather-tight, heated and air-conditioned field office for use by only Construction Management personnel engaged in construction activities; of sufficient size to accommodate required office personnel and meetings of 20 persons at Project site. Construction Manager Field office to be maintained for the **DURATION** of the project.

- 1. Furnish and equip each office as follows:
- a. Provide one room furnished with one desk and three chairs, four-drawer file cabinet, a plan table, a plan rack, 4-foot-square tack board and bookcase.
- b. Provide one room of not less than 240 sq. ft. for Project meetings. Furnish room with conference table, 20 folding chairs, 3-foot by 4-foot white marker board, and 4-foot-square tack board.
- c. Water cooler and private toilet complete with water closet, lavatory, and medicine cabinet with mirror.
- d. Provide one 3.6 cu. ft. refrigerator.
- e. Provide one microwave.
- f. Provide one first aid kit: Johnson and Johnson Co., Model No. 25 or equal.
- g. Provide one EcoTank Pro ET-5150 Wireless All-in-One Supertank Printer:
 - 1) Provide ink and supplies for the project duration
- h. Provide 20-reams (5,000 sheets) of 8-1/2-inch by 11-inch, 24-pound laser paper
- i. Provide one personal computer from the following options, including all required cables, with the following attributes:
 - 1) DELL or HP Business Classic PC
 - 2) 8th Generation Intel Core i700-8700 Processor
 - 3) Windows 10 Pro 64-bit English
 - 4) MS Office 2016 Professional
 - 5) 24" LCD monitor
 - 6) 6GB, DDR4, 2666MHz
 - 7) 3.5 inch 1TB 7200rpm SATA Hard Drive
 - 8) Wireless and Ethernet Networking
- j. SSD External Hard Drive 2TB
- k. Provide security bars at doors and security screens at all windows.
- I. Provide stairs at each door
- 2. Provide heater with thermostat capable of maintaining a uniform indoor temperature of 68 deg F.
- 3. Provide fluorescent light fixtures capable of maintaining average illumination of 25 fc at desk height. Provide 110- to 120-V duplex outlets spaced at not more than 12-foot intervals, 1 per wall in each room.
- 4. Provide one large and two small trash cans with bags for project duration.
- 5. Janitorial Services: Provide janitorial services on a weekly basis for temporary Construction Manager field office.
- 6. The contents of the Field Office shall become the property of the Owner upon Substantial Completion of the Contract.
- C. All Prime Contractors may with permission from the Construction Manager, establish a field office for their own use. Said offices for the individual Prime Contractors shall be of such size and design as approved by the Construction Manager and shall be located as directed by the Construction Manager.
- D. Each Contractor shall provide daily housekeeping for their office spaces.
- E. Maintain, in the Contractor's field office, all articles necessary for First Aid treatment; further, the Contractor shall establish standing arrangements for the immediate removal and hospital treatment of any employees and other persons on

the job site who may be injured or who may become ill during the course of the work.

1.04 TEMPORARY AND PERMANENT SERVICES, GENERAL

- A. The Contractor shall provide and maintain, either directly or through its' subcontractors, all temporary services and utilities, including all labor, materials, equipment and the like necessary to adequately furnish, deliver and maintain said services at all times when required during the term of the Contract.
- B. Temporary work shall generally include, but not be limited to temporary light and power; temporary heat; temporary toilets; temporary water; hoisting systems; rubbish chutes; temporary stairs, rails and shaft protection; storage; temporary fences; roof protection; temporary enclosures and the like required to conduct the work in a proper manner.
- C. The Contractor's use of any permanent system or service of the building or portions thereof shall be subject to the Owner's approval.
- D. The Contractor shall be responsible for any and all damage to permanent services used, and shall make good any and all damage to the satisfaction of the Owner, prior to final completion and acceptance.

1.05 TEMPORARY LIGHT AND POWER

- A. The energy will be supplied, **and paid for**, by the Owner for all work within the present building. <u>Abuse of service will be cause for termination of service. No reimbursement will be made by Owner in the event of disconnect</u>.
- B. Where feasible locations for temporary power shall be from the nearest adequate duplex or simplex outlet to the work of this Contract.
- C. Because of the high concentration of computers within the building, electrically powered welding equipment shall not be connected to the Owner's wiring system. Self-generated welding equipment shall be used. It shall be the responsibility of the General Contractor that any electric welding equipment used on the project will not have any harmful effect on existing computers, computer storage systems or other computer equipment.
- D. Electrical contractor shall provide temporary power to all Prime Contractor's temporary field offices and the Construction Manager's field office.

1.06 TEMPORARY HEATING/COOLING FACILITIES

- A. The existing heating/cooling/dehumidification system within the building may be used to provide required ambient temperatures within the project, however, the Owner reserves the right to terminate service, without incurring additional cost, in the event of abuse of system.
- B. When the permanent heating/cooling/dehumidification system within the building is disconnected to perform the Work of this project, and until such time the permanent system may be operable again, the HVAC Contractor shall provide and pay for all temporary heating/cooling/dehumidification systems and required fuel to maintain the ambient temperature and humidity in such areas at the level the Owner typically maintains in that area. In addition, the HVAC Contractor shall maintain the critical installation temperatures, provided in the technical provisions of the specifications, herein, for all work in those areas where same is being performed.

Attention is directed to specific temperature requirements for painting, carpentry, flooring and such other temperature sensitive operations connected with the execution of the Work.

- C. Before and during the placing of wood finish and the application of other interior finishing, varnishing, painting, etc. and until final acceptance by the Owner of all work covered by the Contract, the Contractor shall, unless otherwise specified in the Contract Documents, maintain a temperature of between 65 and 85 degrees F. Coordinate with Division 9 of the Technical Specifications.
- D. The existing and new heating/cooling/dehumidification systems may be used to furnish temporary heating and cooling upon receiving permission from the Construction Manager. The warranty for the new HVAC system shall not commence until Owner acceptance of such facilities. Upon Substantial completion, clean all ducts and filters of the HVAC system used during construction.
- E. HVAC Contractor shall provide up to (3) filter changes during the course of the project and final cleaning of all existing mechanical equipment affected by construction project including but not limited to all ductwork, fans, register covers, fin tubes, covers, etc.
- 1.07 TEMPORARY TOILET FACILITIES
 - A. The General Contractor shall provide suitable toilet facilities for the use of all Prime Contractors, at approved locations complying with all state and local requirements in every respect as follows:
 - 1. Toilets shall be portable chemical type with screened enclosures each having a urinal and closet and mounted on skids. One (1) unit shall be provided for every 25 employees.
 - 2. Each unit shall be serviced by the renter at least twice a week, including removal of water matter, sterilizing, recharging tank, refilling tissue holders and thorough cleaning and scrubbing of entire interior.
 - 3. Each unit shall be delivered to site, located as directed, relocated if desired, and removed from site by rental company when required.
- 1.08 TEMPORARY WATER
 - A. The Owner will provide water service to the Prime Contractor without charge, but reserves the right to terminate, without incurring additional cost, said service in the event of abuse of such service.
 - B. Each Contractor shall make all necessary connections and extend piping to areas required at no additional cost to the Owner.
 - C. Each Contractor shall have all equipment for the temporary water removed at the completion of the Project or when directed by the Construction Manager.
- 1.09 STORAGE FACILITIES
 - A. Each Contractor shall provide tool houses, sheds, storage trailers and other facilities as required for his own use. Locate where directed by the Construction Manager. No storage will be permitted inside the building.
 - B. Materials delivered to the site shall be safely stored and adequately protected against loss or damage. Particular care shall be taken to protect and cover materials that are liable to be damaged by the elements.

- C. Due to limited on site storage space, each Contractor shall coordinate delivery of materials with the building operating personnel, who will determine when large deliveries shall be made and shall designate storage locations on site for delivered materials.
- 1.10 SCAFFOLDING AND STAGING
 - A. All scaffold, staging and appurtenances thereto shall comply in total to the requirements of Safety and Health Regulations for Construction Chapter XVII of OSHA, Part 1926 and all related amendments.
- 1.11 EXTERIOR CLOSURES
 - A. GC shall provide temporary weathertight closures for exterior openings to provide acceptable interior working conditions, to allow for temporary heating and maintenance of ambient temperatures required in individual specification sections, to protect the Work, and to prevent entry of unauthorized persons.
 - B. GC shall provide access doors with locking hardware.
- 1.12 TEMPORARY PARTITIONS
 - A. GC shall provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by the Owner from fumes and noise.
 - 1. Construct dustproof partitions with fire rated gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
 - 2. Where fire-resistance-rated temporary partitions are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 3. Insulate partitions to control noise transmission to occupied areas.
 - 4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 - 5. Protect air-handling equipment.
 - 6. Provide walk-off mats at each entrance through temporary partition.
 - 7. Doors shall be equipped with panic devices at all temporary partitions.
- 1.13 ROOF PROTECTION
 - A. During the construction period the Contractor shall take strict precautions against unnecessary traffic on the roofing surface.
 - B. The Contractor shall provide temporary protection on the roof surface when it is necessary for work to take place on completed sections.
 - C. Upon such notification as required in subparagraph A, the Contractor shall assume responsibility for damages, if any, to the roofing system caused by the work of other trades, except that financial liability for any and all damages rests with the offending trade
- 1.14 RUBBISH CONTAINER
 - A. General Contractor shall provide suitable rubbish container device(s) for the use of all Prime Contractors, properly maintained and serviced, replaced as required and protected from access by the public by fencing as may be specified herein or approved by the Construction Manager.
 - B. Each Contractor and Subcontractor shall sweep up and gather together daily all his own rubbish and removed materials and place same in containers to be provided by the Contractor. Wood crates and similar matter shall be broken up,

securely tied into bundles and stacked alongside rubbish containers OR in locations as directed by the Contractor. Items larger then container capacity shall be removed from the site by the respective contractor

1.15 CONSTRUCTION FENCING

- A. Construction fencing shall be provided by the GC enclosing all work and storage areas or where indicated on the drawings. Unless otherwise shown or directed, all fencing shall be 8 feet high, accurately aligned and plumb, adequately braced, and complete with gates, locks, and hardware as required. UNDER NO CONDITIONS SHALL FENCING BE ATTACHED OR ANCHORED TO EXISTING CONSTRUCTION OR TREES.
- B. Fencing shall be as follows:
 - 1. Fencing traversing paved areas shall be free standing sandbagged barrier type in a continuous manner, firmly aligned and securely mounted. Fencing shall essentially consist of heavy timber wood sill with chainlink fencing consisting of 2 inch posts with top and bottom rails of 1 inch pipe and No. 9 wire fabric. All fencing shall be galvanized.
- C. Site access gates shall be provided as required of same material as site fence complete with all operating hardware and security devices.
- D. Contractor shall submit drawings showing type, materials and construction of fencing to Construction Manager for approval before proceeding with installation.
- E. All wood or metal products, unless galvanized, shall receive 2 coats of latex exterior paint of color and manufacturer as approved by the Architect.
- F. Should fencing be required to be relocated during the course of the project, same shall be done at the total expense of the Contractor. At the completion of the project, the Contractor shall remove and dispose of the construction fencing.
- G. The construction fence shall be MAINTAINED IN GOOD ORDER by the Contractor throughout the life of the project.

1.16 PROTECTION OF TREES

A. All trees in the immediate project area, including fenced staging areas, shall be protected from construction operations.

1.17 JANITORIAL SERVICE/DAILY CLEANUP

A. Each Contractor shall furnish daily janitorial services for the project and perform any required maintenance of facilities as deemed necessary by the Architect during the entire life of the contract.

Toilet facilities shall be kept clean and sanitary at all times. Services shall be accomplished to the satisfaction of the Architect.

Each Contractor shall provide daily trash collection and cleanup of the project area and shall dispose of all discarded debris, and the like in a manner approved by the Architect.

- B. The General Contractor shall place foot wiping carpet at all entrances, exits to the work areas and provide daily cleaning for all dust and footprints from the corridors, stairs, and the like, caused by construction.
- C. The General Contractor shall perform a weekly clean up of the project site and building areas under construction every Friday afternoon.

- 1.18 BURNING: Burning will not be permitted.
- 1.19 DUST CONTROL: The Contractor shall, at all times, provide adequate dust control measures. He shall accomplish this without interference with the operations of the Owner or the safe progress of the work.
- 1.20 PROJECT SIGN
 - A. Provide a 4' x 8' plywood project identification sign painted with content as directed by Construction Manager, and placed on the site where directed by the Construction Manager.

1.21 MAINTENANCE OF PERMANENT ROADWAYS

- A. The General Contractor, for the life of the project, shall immediately remove dirt and debris which may collect on permanent roadways due to the work. This includes permanent roads and sidewalks adjacent to the project site.
- 1.22 TRAFFIC CONTROL
 - A. Road closing permits, if needed, shall be procured and paid for by the General Contractor.
 - B. Parking areas for the use of those engaged in the work shall be on the street; no school on-site parking is available.
- 1.23 FIRE PREVENTION CONTROL
 - A. All Contractors shall comply with the safety provisions of the National Fire Protection Association's "National Fire Codes" pertaining to the work and, particularly, in connection with any cutting or welding performed as part of the work.

1.24 TEMPORARY FIRE PROTECTION

A. Each Contractor shall take all possible precautions for the prevention of fires. Where flame cutting torches, blow torches, or welding tools are required to be used within the building, their use shall be as approved by the Architect at the site.

When welding tools or torches of any type are in use, have available in the immediate vicinity of the work a fire extinguisher of the dry chemical 20 lbs. type. The fire extinguisher (s) shall be provided and maintained by the Contractor doing such work.

- B. Fuel for cutting and heating torches shall be gas only and shall be contained in Underwriter's laboratory approved containers. Storage of gas shall be in locations as approved by the Owner and subject to Fire Department regulations and requirements.
- C. No volatile liquids shall be used for cleaning agents or as fuels for motorized equipment or tools within a building except with the express approval of the Owner and/or Architect and in accordance with local codes. On-site bulk storage of volatile liquids shall be outside the buildings at locations directed by the Owner, who shall determine the extent of volatile liquid allowed within the building at any given time.

- D. The Contractor shall comply with the following requirements relating to compressed gas:
 - 1. Where compressed gas of any type is used for any purpose at the site, it shall be contained in cylinders complying with ICC regulations. Gases of different types shall not be stored together except when in use and when such proximity is required.
 - 2. All gas cylinders shall be stored in sheds constructed of noncombustible materials. Sheds shall be well ventilated and without electric lights or fixtures and shall be located as far from other buildings as is practicable. All gas cylinders not in actual use, or in proposed immediate use, shall be removed from the building under construction or reconstruction. Empty gas cylinders shall be removed prior to bringing in a replacement cylinder. Cylinders shall at all times be supported and braced in an upright position. When not is use, the protective cap shall be screwed over the valve.
 - 3. All persons required to handle gas cylinders or to act as temporary firemen (Fire Watchers) shall be able to read, write and understand the English language; they shall also be required by the Contractor to read Part 3 of Pamphlet P-1 "Safe Handling of Compressed Gases" published by the Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.
 - 4. Where LP-Gas is required for Temporary Heat (including Construction Heat), the number of the cylinders within the structure or building shall be limited to the least amount required; in general, one (1) cylinder per heater. Cylinders and heaters shall be connected with two (2) braid neoprene hoses fitted at each end with threaded unions and capable of withstanding a pressure of 250 P.S.I. The length of those shall not exceed 30 feet and shall be protected from mechanical injury, kinking and abrasion. Heaters shall not be less than 6 feet from any cylinder and not less 10 feet from any tarpaulins or type closure. All debris and rubbish shall be removed to prevent fire hazards.
 - 5. Where local ordinances are in effect regarding gas cylinders, (their use, appurtenances and handling), such ordinances shall supplement the requirements of this paragraph. All personnel engaged in firewatch shall be certified by the Local Fire Department having jurisdiction.
 - 6. LP-Gas Heating will not be permitted in enclosed areas below grade.
 - 7. Any cylinder not having the proper ICC markings or reinspection marking, or any cylinder with a leak shall be isolated immediately away from any building and the supplier shall be immediately notified; such other precautions as may be required to prevent damage or injury shall also be taken by the Contractor.
- E. The Contractor shall comply with the following requirements relating to welding and cutting:
 - 1. All cutting and/or welding (electric or gas) must be done only by skilled, certified and licensed personnel.
 - 2. During welding or cutting operations, a contractor's man shall act as a fire watcher. The fire watcher shall have proper eye protection and suitable firefighting equipment including fire extinguisher (bearing current inspection Certificate), protective gloves and any other equipment deemed necessary.
 - 3. Welding or cutting shall not be done near flammable liquid, vapors or tanks containing such material.

- 4. Where cutting or welding is done above or adjacent to (within two feet) combustible material or persons, a shield of incombustible material shall be installed to protect against fire or injury to sparks or hot metal.
- 5. Tanks supplying gases for welding or cutting are to be placed in an upright position securely fastened, and as close as practical to the operation. Tanks, actives or spares, shall be protected from excess heat and shall not be placed in stairways, hallways or exits. When not in use, protective valve cap shall be screwed on the cylinder.
- 6. Adequate fire extinguishing equipment shall be maintained at all welding or cutting operations.
- 7. The Contractor shall secure all required inspections.
- 8. All equipment, hoses, gauges, pressure reducing valves, torches, etc., shall be maintained in good working order and all defective equipment shall immediately be removed from the job.
- 9. No person shall be permitted to do any welding or cutting until his name, address and current license number have been submitted in writing to the Owner.
- F. Contractors for work outside the building shall commence operations promptly on award of Contract, and shall be responsible for same being kept clear of materials and debris in connection with their own work and that of other Contractors. If a Contractor for outside work allows other contractors to deposit material and debris over its lines, the Contractor shall be responsible for all delay and extra cost occasioned thereby.

1.25 DISCONTINUANCE, CHANGES AND REMOVAL

All Contractors shall:

Α.

- 1. Discontinue all temporary services required by the Contract when so directed by the Owner or the Architect.
- 2. The discontinuance of any such temporary service prior to the completion of the work shall not render the Owner liable for any additional cost entailed thereby and each Contractor shall thereafter furnish, at no additional cost to the Owner, any and all temporary service required by such Contractor's work.
- 3. Remove and relocate such temporary facilities as directed by the Owner or the Architect without additional cost to the Owner, and shall restore the site and the work to a condition satisfactory to the Owner.

TEMPORARY EROSION AND SEDIMENT CONTROL

Part 1 - GENERAL

- 1.01 GENERAL
 - A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
 - B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
 - C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.
- 1.02 RESPONSIBILITY
 - A. Assume responsibility for the temporary control of soil erosion and water pollution resulting from performance of the work of this contract.
 - B. In the event of conflict between these specifications and the regulation of other Federal, State, or local jurisdictions, the more restrictive regulations shall apply.
 - C. The Contractor shall engage services of a Certified Professional in Erosion and Sediment Control (EPESC) or a licensed professional engineer to conduct regular inspections at least once every seven calendar days and within 24 hours after each storm producing 0.5 inches of rainfall or greater.
- 1.03 DESCRIPTION
 - A. The Work shall consist of temporary control measures as required to provide temporary control of soil erosion or water pollution and work in conjunction with technical specifications, specifically:
 - 1. Site Preparation and Protection (31 10 00)
 - 2. Earthwork (31 23 00)
 - 3. Lawns and Grasses (32 92 00)
 - B. Temporary measures shall include silt fences, inlet protections, berms, sedimentation basins, silt screens, mulches, grasses, or other erosion control devices or methods as required.
- 1.04 SUBMITTALS
 - A. Outline description of erosion and sediment containment program complete with implementation drawings if requested; coordinate with requirements set forth in Section 01 57 19.
 - B. Material samples and product data as applicable to the particular products.
 - C. Material safety data sheets on all products, as necessary.
- 1.05 AUTHORITY
 - A. The Owner's Representative and/or Architect has the authority to limit the surface area of erodible earth exposed by earthwork operations and to direct the Contractor to provide immediate temporary or permanent erosion or pollution control measures to minimize damage to property and contamination of watercourses and water impoundments.

1.06 COORDINATION AND SCHEDULING

- A. Schedule the work so as to minimize the time that raw earth areas will be exposed to erosive conditions.
- B. Coordinate the use of temporary controls with the permanent erosion control features or finish materials shown.
- C. Incorporate permanent control features into the work at the earliest practical time.

Part 2 - MATERIALS

2.01 MATERIALS

- A. Sedimentation control system shall complete including silt fence, hardwood or metal posts, etc. as manufactured by:
 - 1. Marafi Inc/Carlisle "Envirofence System"
 - 2. Akzo Nobel "Enkamat System"
 - 3. Webtec, Inc. "EconoFence"
 - or approved equal.
- B. Haybales and/or sandbags shall be as approved by the governing authorities. Haybales shall be in good condition and shall be new.
- C. Erosion Control Mats: Knitted construction containing natural wood mulch similar and equal to that as manufactured by:
 - 1. Erosion Control Systems (1020-03).
 - 2. North American Green, Inc. (Series "SC150").
 - 3. Synthetic Industries ("Polyjute").
 - 4. Webtec, Inc. (TerraJute).
 - 5. American Excelsior (Curlex).
 - or approved equal.
- D. Grasses: Seed mixture as specified in Section 32 92 00 or other species suitable for temporary cover which will not compete with the grasses sown later for permanent cover.

Part 3 - EXECUTION

- 3.01 WORK AREAS
 - A. The Architect may limit the area of clearing and grubbing and earthwork operations in progress commensurate with the Contractor's demonstrated capability in protecting erodible earth surfaces with temporary or permanent erosion control measures.

3.02 GENERAL

- A. The Contractor shall provide suitable and adequate means of sedimentation and erosion control during construction. Control measures shall prevent all erosion, siltation and sedimentation of waterways, drainage systems, construction areas, adjacent areas and off-site areas. Work shall be accomplished on and/or adjacent to the following work areas:
 - 1. Earthwork stockpiles and on-site storage and staging areas.
 - 2. Cut and fill slopes and other stripped and exposed graded areas.
 - 3. Constructed and existing swales and ditches.
 - 4. Unestablished lawns and seeded embankments.
- B. Means of protection as noted on the Contract Drawings indicate the minimum provisions necessary. Additional means of protection shall be provided by the

Contractor as required for continued or unforeseen erosion problems, at no additional expense to the Government.

- C. Periodic maintenance of all sediment control installations shall be provided to ensure intended purposes are accomplished. Sediment control measures shall be in working condition at the end of each day.
- D. After any significant rainfall, sediment control devices shall be inspected for integrity. Any damaged device shall be corrected immediately.
- E. The Contractor shall provide adequate means of control of runoff, as to not detrimentally impact downstream conditions during construction.
- F. In the event that the Contractor is unable to sequence the work so that construction of the permanent drainage mitigation systems precedes the upland work, then the Contractor shall submit a plan indicating his proposed methods of otherwise controlling runoff from the site.
- G. Erosion and sediment control measures must be in place prior to construction activity and remain in place and functional until the site is permanently stabilized.
- H. Location of erosion and sediment control measures shall be as required by the drawings and in accordance with outline of the environmental governing authority within the jurisdiction of the work.
- I. Any area that remains in a disturbed condition where construction is not on-going for a period of more than 20 days shall receive a specified erosion control method as approved by the Contracting Officer.
- 3.03 SILT FENCE
 - A. Install silt fence, well-staked at maximum 5 foot intervals in locations as shown on Contract Drawings and as directed. Staking shall occur on the disturbed area side.
 - B. Secure fabric to posts on upstream side and bury fabric end within a 6 inch wide by 6 inch deep cut-in trench. Wrap the fabric bottom around the inside of the trench and backfill excavated soil into the fabric pocket to anchor the fence fabric.
 - C. Silt fence may be used for stabilization of areas that are not stabilized at the end of the day.
 - D. Install per manufacturer's requirements.
- 3.04 STRAW BALES
 - A. Straw bale barriers may be used for existing inlet or outlet protection and stabilization of areas that are not stabilized at the end of the day.
 - B. Inlet and Outlet Protection: Place straw bales around the exterior of the inlet structure to trap and retard sediment.
 - C. Stabilization: Excavate a shallow trench the width and length of the bale, 4 inches deep. Place and stake straw bales into trench. Stakes shall be driven into the ground to a minimum depth of 18 inches below the grade around the straw bale. Wedge loose straw into the cracks between bales. Backfill and compact the excavated soil to form an anchor toe on the upslope side of the bale.
- 3.05 MAINTENANCE
 - A. Inspect all erosion control devices daily. Immediately repair, adjust, and replace devices if damaged, displaced, or rendered ineffective in any way. When the area is subjected to a rainfall of 1 inch or more within 24 hours, all erosion control facilities shall be inspected and repairs shall be made within 48 hours after the storm. Disposal of materials removed from the control facilities shall be the responsibility of the Contractor as part of site restoration and cleanup.

3.06 REMOVAL AND DISPOSAL

- A. At least 70 percent of the disturbed area of the site must be established with erosion resistant cover before interim stabilization measures and temporary erosion and sedimentation control measures may be removed.
- B. Do not remove erosion control devices and materials without prior approval of the Architect.
- C. Prior to removal of devices, remove all retained silt or other materials and dispose of as specified in Section 31 23 00.

3.07 WASTE MANAGEMENT – Coordinate with Section 01 74 19

- A. Separate and recycle materials and material packaging in accordance with Waste Management Plan and to the maximum extent economically feasible and place in designated areas for recycling.
- B. Set aside and protect materials suitable for reuse and/or remanufacturing.
- C. Separate and fold up metal banding; flatten and place along with other metal scrap for recycling in designated area.

ENVIRONMENTAL PROTECTION DURING CONSTRUCTION

- 1.01 GENERAL
 - A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions to the Contract and the balance of Division #1 and Technical Specifications.
 - B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
 - C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Scope
- B. Applicable Regulations
- C. Protection of Land Resources
- D. Protection of Water Resources
- E. Burning
- F. Maintenance of Pollution Control Facilities During Construction
- 1.03 SCOPE
 - A. The work covered by this section consists of furnishing all labor, material and equipment and performing all work required for the prevention of environmental pollution during and as the result of construction operations under this contract except for those measures set forth in other Technical Provisions of these specifications.

For the purpose of this specification environmental pollution is defined by regulatory authorities as the presence of chemical, physical or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and recreational purposes.

The control of environmental pollution requires consideration of air, water and land, and involves noise, solid waste-management and management of radiant energy and radioactive materials, as well as other pollutants.

B. Compliance with the provisions of this section by all Subcontractors shall be the responsibility of the Contractor.

1.04 APPLICABLE REGULATIONS

A. In order to provide for abatement and control of any environmental pollution arising from the construction activities of the Contractor and his subcontractors in the performance of this contract, they shall comply with all applicable Federal, State and local laws, and regulations concerning environmental pollution control and abatement as well as the specific requirements stated elsewhere in the contract specifications.

1.05 PROTECTION OF LAND RESOURCES

- A. It is intended that the land resources within the project boundaries and outside the limits of permanent work performed under this contract be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. Insofar as possible, the Contractor shall confine his construction activities to areas defined by the plans or specifications.
- B. The following additional requirements are intended to supplement and clarify the requirements contained in the General Conditions.

The location on the project site of the Contractor's storage and other construction buildings, required temporarily in the performance of the work, shall be upon assigned portions of the job site and shall require written approval of the Architect.

The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the overall construction of buildings.

Plans showing storage and office facilities shall be submitted for approval of the Construction Manager.

- C. If the Contractor proposes or is required to construct temporary roads or embankments and excavations for plant and/or work areas, he shall submit the following for approval at least 21 days prior to scheduled start of such temporary work.
 - 1. A layout of all temporary access roads, excavations and embankments to be constructed with the work area.
 - 2. Plans and cross sections of proposed embankments and their foundations, including a description of proposed materials.

1.06 PROTECTION OF WATER RESOURCES

- A. The Contractor shall not pollute streams, lakes, reservoirs or public waters with fuels, oils, bitumens, calcium chloride, acids or harmful materials.
- B. It is the responsibility of the Contractor to investigate and comply with all applicable Federal, State, County and Municipal laws concerning pollution of surrounding public waters.
- C. All work under this contract shall be performed in such a manner that objectionable conditions will not be created in public waters through or adjacent to the project areas.
- D. Prior to any major construction the Contractor shall submit a plan for approval by the Architect showing his scheme for controlling erosion and disposing of waste.
- E. Surface drainage from cuts and fills within the construction limits, whether or not completed, and from borrow and waste disposal areas, shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion within acceptable limits. Temporary erosion and sediment control measures such as berms, dikes, drains, or sedimentation basins, if required to meet the above standards, shall be provided until permanent drainage and erosion control facilities are completed and operative. Fills and waste areas shall be constructed by selecting placement to eliminate silts or clays on the surface

that will erode and contaminate adjacent public waters.

- D. At all times of the year, special measures shall be taken to prevent chemicals, fuels, oils, grease, bituminous materials, waste washings, herbicides and insecticides, and cement and surface drainage from entering public waters.
- E. Disposal of any materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., in areas adjacent to public waters shall be subject to the approval of the Architect.
- F. If any waste material is dumped in unauthorized areas the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area.
- G. If necessary, contaminated ground shall be excavated, disposed of as directed by the Architect, refilled with clean material and compacted all at the expense of the Contractor.
- 1.07 BURNING
 - A. Burning will not be permitted.
- 1.08 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION
 - A. During the life of this contract the Contractor shall maintain all facilities constructed for pollution control under this contract as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.
 - B. During the construction period the Contractor shall conduct frequent training courses for his maintenance personnel. The curriculum shall include methods of detection of pollution, familiarity with pollution standards, and installation and care of vegetation covers, plants and other facilities to prevent and correct environmental pollution.

MATERIAL AND EQUIPMENT

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. General Standards
- B. Products
- C. Sustainability
- D. Transportation and Handling
- E. Storage and Protection

1.03 GENERAL STANDARDS APPLICABLE TO ALL SPECIFICATION SECTIONS

- A. These provisions, standards, and tolerances shall apply to all work under this Contract. Where stricter standards and tolerances are specified elsewhere in these Specifications or in references specified in these Specifications, they shall take precedence over these standards and tolerances.
- B. Build and install parts of the Work level, plumb, square, and in correct position unless specifically shown or specified otherwise.
 - 1. No part shall be out of plumb, level, square, or correct position so much as to impair the proper functioning of the part or the Work as judged by the Architect.
 - 2. No part shall be out of plumb, level, square, or correct position so much as to impair the aesthetic effect of the part or the Work as judged by the Architect.
- C. Make joints tight and neat. Provide uniform joints in exposed work. Arrange joints to achieve the best visual effect. Refer choices of questionable visual effect to the Architect.
- D. Under potentially damp conditions, provide galvanic insulation between different metals which are not adjacent on the galvanic scale.
- E. Manufacturers, subcontractors, and workmen shall be experienced and skillful in performing the work assigned to them; coordinate with Article 5 of Section 00 70 00.
- F. All paint used on all products shall conform to ANSI Z66.1, Specifications for Paints and Coatings Accessible to Children to Minimize Dry Film Toxicity.
- G. The Drawings do not attempt to show every item of existing work to be demolished and every item of repair required to existing surfaces. Perform work required to remove existing materials which are not to be saved and to restore existing surfaces to condition equivalent to new as judged by Architect. If possible, repairs shall be indistinguishable from adjacent sound surfaces. Where it is impossible to achieve repairs which are indistinguishable from adjacent sound surfaces to remain, notify Architect, and proceed according to his instructions.

1.04 PRODUCTS

- A. Products include material, equipment and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.
- D. In the case of an inconsistency between Drawings and the Specifications, or within either document which is not clarified by addendum, the product of greater quality or greater quantity of work shall be provided in accordance with the Designer's interpretation.
- E. Provide environmentally preferable products to the greatest extent possible. To the greatest extent possible, provide products and materials that have a lesser or reduced effect on the environment considering raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and/or disposal of the product.
- 1.05 SUSTAINABILITY
 - A. In the selection of the products and materials of this section as well as for the entire project, preference will be given to those with the following characteristics:
 - 1. Water based.
 - 2. Water-soluble.
 - 3. Can be cleaned up with water.
 - 4. Non-flammable.
 - 5. Biodegradable.
 - 6. Low or preferably no Volatile Organic Compound (VOC) content.
 - 7. Manufactured without compounds that contribute to ozone depletion in the upper atmosphere.
 - 8. Manufactured without compounds that contribute to smog in the lower atmosphere.
 - 9. Do not contain methylene-chloride.
 - 10. Do not contain chlorinated hydrocarbons.
 - 11. Contains the least possible of post-consumer or post-industrial waste.

1.06 TRANSPORTATION AND HANDLING

A. Arrange deliveries of materials in accordance with construction schedules in order to avoid delay in, conflict with, or the impeding of the progress of the Work and conditions at the site.

Deliveries shall be made during regular work hours, unless approved otherwise by the Owner.

B. Deliver materials in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

1.07 STORAGE AND PROTECTION

A. Store materials in accordance with manufacturer's instructions, with seals and labels accessible for inspection.

Contractor shall be responsible for work and equipment until fully inspected, tested and accepted. Carefully store materials and equipment which are not immediately installed after delivery to site. Close open ends of work with temporary covers or plug during construction to prevent entry of obstructing material or damaging water.

- B. Materials stored on the Site shall be neatly arranged and protected, and shall be stored in an orderly fashion in locations that shall not interfere with the progress of the Work or with the operations of the Owner.
- C. Interior Storage: Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- D. If it becomes necessary to remove and restack materials to avoid impeding the progress of any part of the Work or interfering with the work to be done by any other contractor employed on the Work, or interfering with the Owner's activities, the Contractor shall remove and restack such materials at no additional cost to the Owner.
- E. Protection After Installation
 - 1. Provide adequate coverings to protect installed materials from damage resulting from natural elements, traffic, and subsequent construction.
 - 2. Remove when no longer needed.

FIELD ENGINEERING

Part 1 - GENERAL

1.01 SUMMARY

- A. This Section specified field engineering services required for the Project, including but not limited to:
 - 1. Survey work.
 - 2. Civil, structural, or other professional engineering services specified, or required to execute Contractor's construction methods.
- B. Construction Manager will identify existing control points and property line corner stakes indicated on the Drawings, as required.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Related Requirements
- B. Qualifications of Surveyor or Engineer
- C. Survey Reference Points
- D. Project Survey Requirements
- E. Records
- F. Submittals

1.03 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect work on this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
 - 1. General Conditions and Modifications to General Conditions.
 - 2. 01 10 00 Description of Work
 - 3. 01 77 00 Project Closeout

1.04 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. Qualified engineer or registered land surveyor, acceptable to Architect and Owner.
- B. Registered professional engineer of the discipline required for the specific service on the Project, licensed in the state in which the Project is located.

1.05 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the Project are those designated on Drawings.
- B. Locate and protect control points prior to starting sitework, and preserve all permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to Architect.
 - 2. Report to Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - 3. Require surveyor to replace Project control points which may be destroyed. a. Establish replacements based on original survey control.

1.06 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of two permanent bench marks on-site, referenced to data established by survey control points.

- 1. Record locations, with horizontal and vertical data, on Project Record Documents.
- B. Establish lines and levels, locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements.
 - a. Stakes for grading, fill, and topsoil placement.
 - b. Utility slopes and invert elevations.
 - 2. Batter boards for structures.
 - 3. Building foundation, column locations, and floor levels.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- C. From tine to time, verify layouts by same methods.
- 1.07 RECORDS
 - A. Maintain a complete, accurate log of all control and survey work as it progresses.
 - B. On completion of foundation walls and major site improvements, prepare a certified survey showing all dimensions, locations, angles, and elevations of construction in accordance with the requirements of modifications to General Conditions.
- 1.08 SUBMITTALS
 - A. Submit name and address of surveyor and professional engineer to Architect.
 - B. On request of Architect, submit documentation to verify accuracy of field engineering work.
 - C. Submit certificate signed by registered engineer or surveyor certifying that elevation and locations of improvements are in conformance, or non-conformance, with Contract Documents.

CUTTING AND PATCHING

Part 1 - GENERAL

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.
- D. Provide materials, labor, equipment and services necessary and/or required to execute the work of this Section as shown on the drawings, specified herein and/or required by job conditions.
- E. All cutting, removing, relocation, fitting, altering and rough patching for the installation and completion of his work in other than finished surfaces noted below shall be performed by the Trade or Subcontractor requiring said cutting and patching.

FINISH PATCHING SHALL BE BY THE RESPECTIVE TRADE OR SUBCONTRACTOR THAT NORMALLY DOES THAT FINISH WORK.

- F. All finish patching of finished surfaces including exposed concrete, concrete masonry, brick masonry, glazed masonry and the like shall be performed by the trade customarily involved with the finished work.
- G. All coring and finish patching shall be performed by the Contractors requiring such coring work.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Definitions
- B. Cutting and Patching Requirements
- C. Specific Requirements All Trades

1.03 DEFINITIONS

The following definitions shall apply to all work of this Contract involving cutting, patching, filling and the like.

- A. <u>Cutting</u> those operations required to expose existing construction, or required to permit the installation of work under this contract, or passage of new or relocated work through existing construction.
- B. <u>Patching</u> Those operations required to bring surfaces to a level to permit the application of a finish treatment.

The Contractor responsible for performing the patching shall be responsible for the restoration of the substrate to match adjacent areas, whether new or existing, except for the following conditions:

Coordinate with Paragraph 1.05 of this Section

- 1. Exposed masonry, concrete or similar surfaces which do not require or call for painting.
- 2. Those patched surfaces which are wholly contained within an area which is to receive a new finish treatment as called for elsewhere in the Contract Documents.
- C. <u>Replace</u> Shall mean to furnish and install an entirely new element which matches the original element's material, color, dimension and design.
- D. <u>Repair</u> Shall mean to make the existing element as nearly "new", as possible, by the means and methods indicated for each element.
- E. <u>Fill</u> Shall mean to carefully and thoroughly remove, by approved methods, loose and deteriorated surface material and to install "new" material in the element so that the original contour is completely restored and color matched if exposed as a finished element. Follow manufacturers' instructions as applicable.
- F. <u>Match Original</u> Where indicated, this type of replacement will match the best available representative element, in design, dimension, and installation, with improvements which represent the best standards of fabrication, so that even if an existing best example of an element is gouged or pitted, or otherwise worn, the new element shall be unworn and without defects and fabricated of new material. The Architect will provide identifications of all original elements.

1.04 CUTTING AND PATCHING REQUIREMENTS

- A. Where cutting, drilling or removals are required in existing and/or newly constructed wall, floor or roof construction, the work shall be done in a manner that will safeguard and not endanger the structure, and shall, in all cases, be as approved by the Architect.
- B. Prior to any cutting, drilling or removals, the Contractor shall investigate both sides of the surface involved, shall determine the exact location of adjacent structural members by visual examination, and shall avoid interference with such members.
- C. No structural members such as joists, beams, columns supporting work that is to remain shall be cut, drilled or removed unless such conditions are shown in detail on the Contract Documents and reinforcing of members affected or new members to compensate for such drilling, cutting and removals are shown. Positive instructions shall be obtained from the Architect before cutting beams or other structural members, arches, lintels and the like and the Contractor shall be guided by such instructions.
- D. Each Trade Contractor shall provide all sleeves, inserts, hangers and the like required for the execution of their respective work; failing to provide such, said responsible Contractor shall reimburse the General Contractor who shall do all necessary cutting and patching required for the execution of his work.

Coordinate with individual trade sections for sleeve types, packing of sleeves, pipe penetrations and duct openings for fire safing material and/or caulking; coordinate with Section 078413 for firestopping systems.

- E. No Contractor shall:
 - 1. endanger any work by cutting or drilling or otherwise;
 - 2. cut or alter the work of any other contractor except with the written consent of the Architect.
 - 3. cut or drill above the minimum needed to install work.

- F. <u>All holes cut through masonry exposed to view in the finished work and concrete</u> <u>slabs shall be core drilled except for specific holes that have been structurally</u> <u>detailed per Contract Documents</u>. The Contractor shall locate adjacent structural members before core drilling to ensure that structural members are not damaged. No jack hammering will be permitted in the work within any occupied portions of a structure.
- G. Exposed patches and repairs shall be as inconspicuous as possible. Where new work does not match exactly the color, finish, dimension, size and the like of the existing, the new work <u>shall</u> be carried across the surface to which it is applied and be continued to a natural stopping point or corner.
- H. All cutting and patching shall be performed using skilled mechanics of the trade or craft involved. Where two or more contractors are involved with work within same penetration, safing shall be performed by the trade with the largest share of the opening being used.
- I. Each Contractor shall perform specific work for installation of new mechanical, plumbing, electrical, telecom and AV in existing exterior and interior masonry, concrete, stone, plaster and drywall walls. Patching where existing conduit and devices were surface mounted and required to be removed shall be performed by the specialty trade customarily responsible for that type of work.
- J. Cutting and Patching of Existing Roofing System: Contractors performing cutting and patching of the existing roof membrane shall be certified installers by the existing roof membrane manufacturer for their products. When existing roofing system is still under warranty, coordinate all work on the existing roofing system with manufacturer. All cutting and patching work on roofing system shall be performed in a manner that does not void the warranty.

1.05 SPECIFIC REQUIREMENTS BY CONTRACTS

- A. The General Contractor, or Subcontractors directly related to the "general construction operations", shall perform -
 - 1. All cutting and patching required to install their work under the Contract and as indicated on the Architectural, Structural and Site drawings.
 - 2. Cutting and patching of existing concrete slabs on grade in connection with underground utility work for all plumbing, heating, electric and other services; work shall be ascertained from the companion plumbing, heating and fire protection drawings; all such excavations needed shall further be accomplished by the General Contractor.
 - 3. GENERAL CONTRACTOR SHALL PROVIDE ALL REQUIRED CUTTING AND PATCHING OF ROOF MEMBRANE AND INSULATION SYSTEMS FOR REFRAMING, CURBS, AND FLASHINGS AS REQUIRED FOR NEW ROOF EQUIPMENT OR PENETRATIONS PROVIDED BY OTHER CONTRACTORS.
- B. The HVAC Contractor shall perform -
 - 1. All cutting and rough patching required to install his work under the Contract.
 - 2. Cutting, rough and finish patching of existing walls, floors and ceilings, including refinishing of all disturbed surfaces, for the installation of new ductwork, piping and equipment, which are beyond the extent of work areas that will be removed/replaced by the General Contractor as indicated on the Architectural, Structural and Site drawings. This work statement shall be deemed to include any required trenching, bedding and backfill

operations made necessary.

- 3. Cutting and patching of existing slabs <u>within the General Contractors</u> <u>immediate work areas</u> for the installation of new ductwork and piping shall be accomplished by the General Contractor.
- C. Electrical Contractor shall perform -
 - 1. All cutting and rough patching required to install his work under the Contract.
 - 3. Cutting and rough and finish patching of existing walls, floors and ceilings, including refinishing of disturbed surfaces, for the installation of new conduits, busduct, feeders, fixtures and equipment, which are <u>beyond the extent of work areas that will be removed/replaced by the General Contractor as indicated on the Architectural, Structural and Site drawings.</u> This work statement shall be deemed to include any required trenching, bedding and backfill operations made necessary.
 - 4. Cutting and patching of existing slabs <u>within the General Contractors</u> <u>immediate work areas</u> for the installation of new ductwork and piping shall be accomplished by the General Contractor.

CLEANING

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.02 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Description
- B. Safety Requirements
- C. Materials
- D. Cleaning During Construction
- E. Final Cleaning

1.03 DESCRIPTION

- A. In addition to that work required under Articles 3.15 and 6.3 of the AIA General Conditions, the Work included shall generally consist of the following:
 - 1. Maintain premises and all properties free from accumulations of waste, debris and rubbish caused by operations connected with the Work.
 - 2. The General Contractor shall provide for the continual removal of rubbish and debris from the area until completion of the Work and shall bear the cost of all tipping fees.
 - 3. Each Prime Contractor shall sweep up and gather together daily, all his own rubbish and deposit same at a location, or locations, as directed by the Contractor.
 - 4. At completion of Work, each respective Contractor shall remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy;
 - 5. Staging areas, walkways, grounds and any areas affected by the work shall be cleaned of debris and restored to "new" condition by the General Contractor.
- B. Related Work Specified Elsewhere
 - 1. 01 10 00 Description of Work
 - 2. 01 31 13 Mechanical and Electrical Coordination
 - 3. 01 73 29 Cutting and Patching
 - 4. 01 50 00 Temporary Facilities
 - 5. 01 77 00 Project Closeout
 - 6. Cleaning for specific products or work: Reference specific Section for that work.

1.04 SAFETY REQUIREMENTS

A. Standards: Maintain project in accord with following safety and insurance standards:

- 1. Occupational Safety and Health Administration (OSHA)
- 2. 2016 New York State Uniform Fire Prevention and Building Code and 2016 and 2017 Uniform Code Supplements
- 3. State Education Department Manual of Planning Standards
- B. Hazards Control
 - 1. Store volatile wastes in covered metal containers, and remove from premises daily.
 - 2. Prevent accumulation of wastes which create hazardous conditions.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.
- C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - 1. Do not burn or bury rubbish and waste materials on project site.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 3. Do not dispose of wastes into streams or waterways.
- 1.05 MATERIALS
 - A. Utilize non-toxic cleaning materials and methods.
 - 1. Comply with GS 37 for general purpose cleaning and bathroom cleaning.
 - 2. Use natural cleaning materials where feasible. Natural cleaning materials include:
 - a. abrasive cleaners: substitute 1/2 lemon dipped in borax.
 - b. ammonia: substitute vinegar, salt and water mixture, or baking soda and water.
 - c. disinfectants: substitute 1/2 cup borax in gallon water.
 - d. drain cleaners: substitute 1/4 cup baking soda and 1/4 cup vinegar in boiling water.
 - e. upholstery cleaners: substitute dry cornstarch.
- 1.06 CLEANING DURING CONSTRUCTION
 - A. Execute cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
 - B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
 - C. At reasonable intervals during progress of work, clean site and public properties, and dispose of waste materials, debris and rubbish.
 - D. Provide on-site containers for collection of waste materials, debris and rubbish.
 - E. Should waste materials, debris and rubbish be too large for containers above, remove same from site and legally dispose of at public or private dumping areas off Owner's property.
 - F. Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.
 - G. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
 - H. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
 - I. All materials and equipment shall be properly and effectively protected by Prime Contractors. All piping and conduits must be properly capped by installing contractor during construction so as to prevent obstruction and damage. Any

damage resulting in the failure to use proper precautions to this work shall be replaced or altered to the satisfaction of the Architect.

- 1.07 FINAL CLEANING
 - A. Employ experienced workmen, or professional cleaners, for final cleaning.
 - B. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.
 - C. At completion of Work, remove all remaining waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces; leave Project clean and ready for occupancy.

CONSTRUCTION WASTE MANAGEMENT

Part 1 - GENERAL

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Any and all "Waste Handlers and Haulers" shall be licensed by the Authority having jurisdiction over "Solid Waste Management" and a copy of said license shall be submitted in accordance with Article 1.05 herein.
- 1.02 DESCRIPTION OF WORK
 - A. This Section specifies requirements for a complete program for implementation of waste management controls and systems for the duration of the Work and to
 - 1. Protect the environment, both on-site and off-site, during construction operations.
 - 2. Prevent environmental pollution and damage.
 - 3. Maximize source reduction, reuse and recycling of solid waste.
- 1.03 INTENT
 - A. The Owner has established that this Project shall generate the least amount of waste practical and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.
 - B. Of the waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized to the greatest extent practical. Regarding these goals, the Contractor shall develop, for Construction Manager's and Architect's review, a Waste Management Plan for this Project. The Contractor shall be responsible for ensuring that debris will be disposed of at appropriately designated licensed solid waste disposal facilities, as defined by governing laws of the jurisdiction of the Work.
- 1.04 WASTE MANAGEMENT PLAN
 - A. After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Construction Manager and Architect to discuss the proposed Waste Management Plan and to develop mutual understanding relative to details of environmental protection.
 - B. Waste Management Plan: The Contractor shall provide a plan containing the following:
 - 1. Analysis of the proposed jobsite waste to be generated, including types and rough quantities.
 - 2. Landfill Options: The name of the landfills where trash and building debris will be disposed of, the applicable landfill tipping fees, and the projected cost of disposing of all Project waste in the landfills.

- 3. Landfill Certification: Contractor's statement of verification that landfills proposed for use are licensed for types of waste to be deposited and have sufficient capacity to receive waste from this project.
- 4. Alternatives to Landfilling: A list of each material proposed to be salvaged or recycled during the course of the Project. Include the following and any additional items proposed:
 - a. Cardboard.
 - b. Clean dimensional wood.
 - c. Beverage containers.
 - d. Land clearing debris.
 - e. Concrete.
 - f. Bricks and masonry.
 - g. Asphalt.
 - h. Gypsum boards.
 - i. Acoustical ceiling material (grid separate).
 - j. Metals from framing, banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 - k. Glass, colored glass allowed.
 - I. Plastic.
 - 1. Type 1: Polyethylene Terephthalate (PET, PETE).
 - 2. Type 2: High Density Polyethylene (HDPE).
 - 3. Type 3: Vinyl (Polyvinyl Chloride or PVC).
 - 4. Type 4: Low Density Polyethylene (LDPE).
 - 5. Type 5: Polypropylene (PP).
 - 6. Type 6: Polystyrene (PS).
 - 7. Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.
 - m. Paint and paint cans.
 - n. Carpet.
 - o. Insulation.
 - p. Light Fixtures and other electrical apparatus.
 - q. Others as appropriate.
- 5. Meetings: A description of the regular meetings to be held to address waste management.
- 6. Materials Handling Procedures: A description of the means by which any waste materials identified above will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
- 7. Transportation: A description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site) and destination of materials.
- 1.05 SUBMITTALS
 - A. Construction Waste Management Plan: Submit 3 copies of plan within 21 days of date established for the Notice to Proceed.

- B. Calculations and supporting documentation to demonstrate end-of-project recycling rates meeting the requirements for Construction Waste Management Plan of Item above.
- C. For materials separated for recycling off-site, establish a method for tracking the weight of the recycled material. The method shall be included in the CWM Plan for the Construction Manager's and Architect's review and approval.
- D. Waste Reduction Progress Reports: Concurrent with the Applications for Payment, submit three copies of report. Include monthly tabulations for demolition and construction waste sent off-site for disposal or recycling.
- E. Waste haulers solid waste management license.

Part 2 - PRODUCTS - NOT USED

Part 3 - EXECUTION

- 3.01 RECYCLING
 - A. Metal, including but not limited to aluminum stairs, structural beams and sections, and reinforcing steel shall be recycled.
 - B. Wood that is not painted and does not contain preservatives (i.e. creosote, arsenic, and chromium-containing preservatives) shall be segregated and recycled.
- 3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION All sorting will be done "off site" by a recognized construction and demolition processing facility who will be responsible for provision of all documentation as to where loads were processed, and the recycling rate achieved.

PROJECT CLOSE OUT

Part 1 - GENERAL

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.02 REQUIREMENTS INCLUDED

- A. Final Cleanup
- B. Required Close Out Documentation
- C. Orientation Instruction
- D. Project Close Out Inspections
- E. Bake Out Procedures
- 1.03 FINAL CLEANUP
 - A. The Contractor shall leave the work ready for use and occupancy without the need of further cleaning of any kind.
 - B. The Contractor shall remove all tools, appliances, project signs, material and equipment from the phased areas as soon as possible upon completion of the work.
 - C. The work is to be turned over to the Owner in new condition, in proper repair and in perfect adjustment.

1.04 REQUIRED CLOSE OUT DOCUMENTATION

- A. Prior to final payment the Owner shall receive, in addition to those documents required by the General Conditions, the following:
 - 1. Project record documents as per Section 01 77 19.
 - 2. The Contractor's general guarantees.
 - 3. Specific guarantees of material, equipment and systems installed in the work.
 - 4. A copy of all test data taken in connection with the work.
 - 5. Three (3) copies of all operation and maintenance manuals which shall include:
 - a. Parts List, including illustrations, assembly drawings and diagrams required for maintenance, predicted life of parts subject to wear, and recommendations for stocking spare parts.
 - b. Copies of accepted shop drawings, charts and diagrams.
 - c. Names, addresses and telephone numbers of manufacturer's representative and service company.
 - d. Letters from each manufacturer certifying that his equipment was properly installed and is operating in accordance with manufacturer's intent.

- 6. All keys, tools, screens, spare construction material and equipment required to be furnished to the Owner as part of the work.
- Copies of all Certification of Specifications Compliance as per Section 01 33 00.
- 8. Final survey if required by Municipality AND/OR Owner.
- 9. Record of Material Safety Data Sheets (MSDS).
- 10. Certified Payroll Records.
- 11. Fully executed Labor-Materials Affidavit
- 12. Fully executed Daily/Weekly Wage Affidavit
- 1.05 ORIENTATION INSTRUCTION
 - A. Prior to final payment appropriate maintenance personnel of the Owner shall be oriented and instructed by the Contractor in the operation of all systems and equipment as required by the Contract.
- 1.06 PROJECT CLOSE OUT INSPECTIONS
 - A. When the Work has reached such a point of completion that the building or buildings, equipment, apparatus or phase of construction or any part thereof required by the Owner for occupancy or use can be so occupied and used for the purpose intended, the Contractor, <u>prior to notification to the Architect</u>, shall make a preliminary inspection of the Work to insure that all the requirements of the Contract have been met and the Work is substantially complete and is acceptable.
 - B. Upon such notification, the Owner or the Architect and the Construction manager shall make a detailed inspection of the Work to insure that all the requirements of the Contract have been met and that the Work is complete and is acceptable.
 - C. A copy of the report of the inspection shall be furnished to the Contractor as the inspection progresses so that the Contractor may proceed without delay with any part of the Work found to be incomplete or defective.
 - D. When the items appearing on the report of inspection have been completed or corrected, the Contractor shall so advise the Construction Manager and the Architect. After receipt of this notification, the Construction Manager or the Architect shall inform the Contractor of the date and time of final inspection.
 - E. A copy of the report of the final inspection containing all remaining contract exceptions, omissions and incompletions shall be furnished to the Contractor.
 - F. After the receipt of notification of completion and all remaining contract exceptions, omissions and incompletions from the Contractor, the Owner and Architect and the Construction Manager will reinspect the Work to verify completion of the exception items appearing on the report of final inspection.
 - G. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance or will furnish to the Contractor a copy of the report of the Architect's reinspection detailing Work that is incomplete or obligations that have not been fulfilled but are required for final acceptance.
 - H. <u>The Contractor shall pay the Architect and Construction Manager for services</u> performed in inspection beyond the original inspection and two reinspections of the same area, through a "credit" change order to the Owner in accordance with Schedule outlined in Section 01 25 00.
- 1.07 BAKE OUT PROCEDURES HVAC CONTRACT Coordinate with Section 01 15 01
 - A. Heat all areas of new construction to 95 degrees for a minimum of 72 hours.

- B. At the end of this period ventilate area with 100 percent outside air and exhaust air for a minimum of 24 hours to eliminate off gassing that occurs during bake out period.
- C. Change all air filters upon completion.

LABOR AND/OR MATERIALS AFFIDAVIT

STATE OF: _____)

COUNTY OF: _____)

(Name)

being duly sworn, deposes and says that he/she is the _____

(Officer)

of _____

(Name of Company)

furnishing Labor and or Materials in connection with a public improvement for

(Description of Improvement)

That, to his/her knowledge, all subcontractors for Labor and/or Materials Dealers have been

paid the amount of money due them or not less than the amount paid by Owner to the

Contractor as shown by previous requisitions.

(Signature)

(Title)

(Corporate Seal)

State of)ss:)	
County of)	
Sworn to Before Me			
This Day of			, 20_
Notary Public			
(Stamp)			

SECTION 017704
DAILY AND WEEKLY WAGE AFFIDAVIT
STATE OF:)
COUNTY OF:)
(Name)
being duly sworn, deposes and says that he/she is the
(Officer)
of
(Name of Company)
furnishing Labor and or Materials in connection with a public improvement for
(Description of Improvement)
That, to his/her knowledge, all laborers for Daily and Weekly Wages employed by
, on such improvement, have been paid in full
except
(Name and Amount Due, If Any)
This statement read, subscribed and sworn to by me to induce the said Owner to make payment under Contract for such improvement.

(Signature)

(Title)

(Corporate Seal)

State of)
County of)ss:)
Sworn to	Before Me		
This	Dav of		. 20

____, Day

Notary Public (Stamp)

PROJECT RECORD DOCUMENTS (Coordinate with Article 6 of the General Conditions)

Part 1 - GENERAL

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.02 REQUIREMENTS INCLUDED

- A. Project Record Drawings
- B. Record Drawing Certification

1.03 PROJECT RECORD DRAWINGS

A. The purpose of the project drawings is to record the actual location of the work in place including but not limited to underground lines, concealed piping within buildings, concealed valves and control equipment, and to record changes in the work.

In addition to the above, these drawings shall be "color-coded", by each trade, on a daily basis to indicate progress of the work. Color legend will be assigned by the Architect.

B. In addition to the sets of contract drawings that are required by the Contractor on the site to perform the work, the Contractor shall maintain, at the site, one (1) copy of all drawings, specifications and addenda that are part of the Contract as awarded.

Each of these documents should be clearly marked "Project Record Copy", maintained in a clean and neat condition available at all times for inspection by the Owner, Construction Manager or the Architect, and shall not be used for any other purpose during the progress of the work.

The Construction Manager will be the custodian of the project record documents until the end of the Project.

- C. Project Record Requirements
 - 1. The Contractor shall mark-up the "Project Record Copy" to show:
 - a. Approved changes in the work.
 - b. Location of underground work and concealed work.
 - c. Details not shown in the original Contract Documents.
 - d. Any relocation of work including piping, conduits, ducts and the like.
 - e. All changes in dimensions.

- f. All access doors <u>and</u> "tack" locations access points in accessible ceilings.
- g. Location of all plumbing, heating, ventilating, air conditioning or electrical assemblies, whether existing to remain or newly installed.
 h. Revisions to any electrical circuitry.
- 2. Such information shall include, but shall not be limited to:
 - a. Footing depth in relation to finished grade elevations.
 - b. Any change in floor elevations.
 - c. Any structural changes.
 - d. Any substitutions.
 - e. Elevations and locations of all underground utilities, services, or structures referenced to permanent above ground structures or monuments.
 - f. Designation of all utilities as to the size and use of such utilities.
 - g. All invert elevations of manholes.
 - h. The location of all utilities, services and appurtenances concealed in building structures that have been installed differently from that required by the Contract.
 - i. Any approved change order.

and other such data as required by the Architect and/or Owner so as to establish a complete record of "As-Constructed" conditions.

- D. The Contractor shall keep the project record documents up-to-date from day to day as the work progresses. Appropriate documents are to be updated promptly and accurately; no work is to be permanently concealed until all required information has been recorded.
- E. The project record drawings are to be submitted by the Contractor to the Architect through the Construction Manager when all the work is completed and is approved by the Owner and the Architect before the Contractor may request final payment.

If the project record drawings as submitted are found to be unacceptable due to incompleteness or inaccurate information, the drawings shall be returned to the offending Contractor for corrective action and resubmitted for approval prior to the release of final payment.

FINAL PAYMENT IS CONTINGENT UPON PREPARATION OF FINAL PROJECT RECORD DRAWINGS ON A SET OF "PRINTS" and CAD USB DRIVES IN "DXF" or "DWG" FORMAT AS APPROVED BY THE OWNER (A SET OF BASE USB DRIVES WILL BE FURNISHED BY THE ARCHITECT) AND SUBMITTAL OF SAME TO THE OWNER, THROUGH THE ARCHITECT.

F. In addition to the drawings required as mentioned above, the Contractor shall submit a list of all approved Shop Drawings of the Work as installed.

From this list the Architect will select the drawings desired for permanent records. The Contractor shall furnish these in a bound set to the Owner as part of the closeout requirements.

1.04 RECORD DRAWING CERTIFICATION

A. The record drawings required under the terms and conditions of this Section shall be reviewed and processed by each of the Prime Contractors as part of their

overall contractual responsibility.

B. This certification may be issued for individual trades or as a collective document to cover the entire record drawing requirements of the project.

The format of this certification shall be as follows:

These record drawings prepared by:

for _____ have been reviewed by the undersigned and:

Appear to be an accurate representation of the work incorporated within the project and are accepted as submitted in accordance with the technical documents.

This record document review made by this office is for determination of compliance to the requirements of the contract documents.

Firm

Name:

Review	Date:
By:	
,	

OPERATION AND MAINTENANCE REQUIREMENTS (Coordinate with Division 26, Most Restrictive Provisions Apply)

Part 1 - GENERAL

1.01 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.02 REQUIREMENTS INCLUDED

- A. Start Up and Demonstration
- B. Parts List
- C. Operation and Maintenance Data

1.03 START UP AND DEMONSTRATION

- A. The work required herein consists of starting up and demonstrating all systems and equipment to operating personnel <u>and</u> includes training of said operating personnel.
- B. The respective Trade or Subcontractor shall make arrangements, via the Construction Manager (with notification to the Architect), as to whom the instructions are to be given in the operation of the basic and auxiliary systems and the period of time in which they are to be given.
- C. As specified in individual sections, furnish the services of instructors to train designated personnel in adjustment, operation, maintenance, and safety requirements of equipment and systems. If procedures are not specified for specific items of equipment, follow that recommended by the item Manufacturer.
- D. Instructors shall be thoroughly familiar with the equipment and systems and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given after the equipment or system has been accepted and turned over to the Owner. The duration of instruction shall be as specified in individual sections but shall be not less than two (2) days on each portion of operating mechanical/electrical systems. Use Operating and Maintenance Data as a training guide.
- E. The Architect shall be completely satisfied that the representative of the Owner has been thoroughly and completely instructed in the proper operation of all systems and equipment before final payment is made. If the Architect determines that complete and thorough instructions have not been given by the contractor to the Construction Manager, then the offending Contractor shall be directed by the Architect to provide whatever instructions are necessary until the intent of this paragraph of the Specification has been complied with as determined by the Architect.

1.04 PARTS LIST

A. As required the respective Trade or Subcontractor shall furnish three (3) typed sets of instructions for the ordering and stocking of spare parts for all equipment installed. The lists shall include parts numbered and suggested supplier. Each set shall also include an itemized list of component parts that should be kept on hand and where such parts can be purchased.

1.05 OPERATION AND MAINTENANCE DATA

- A. The Contractor shall submit to the Construction Manager for approval three (3) typed sets, bound neatly in hard backed loose leaf binders, of all instructions for the installation, operation, care and maintenance of all equipment, fixtures and systems.
 - 1. Provide typed or printed label identifying binder as operating and maintenance data. List title of project, contract number, and location of equipment.
 - 2. Furnish manufacturer's printed data or sheets neatly typewritten on 8-1/2 inch by 11 inch, 20 pound minimum white paper. Provide indexed tabs.
 - 3. Drawings: Bind in with text. Provide reinforcement rings. Fold larger drawings to the size of the text pages.

Information shall indicate possible problems with equipment and suggested corrective action.

B. CONTENT OF MANUAL FOR EQUIPMENT AND SYSTEMS

The instructions shall contain information deemed necessary by the Architect and include but not be limited to the following:

- 1. Introduction:
 - a. Explanation of Manual and its use.
 - b. Summary description of all mechanical and electrical and equipment operating systems.
 - c. Purpose of systems.
 - d. Maintenance scheduling summary analysis, sheets and software operating instructions and diskette(s).
- 2. System:
 - a. Detailed description of all systems.
 - b. Illustrations, schematics, block diagrams, photographs and other exhibits.
 - c. Complete wiring diagrams, tabulations and installation drawings.
 - d. Valve tag charts and control diagrams.
 - e. 1/2 size reduced copy of "Record Drawings".
- 3. Operations:
 - a. Complete detailed, step-by-step, sequential description of all phases of operation for portion of the systems, including startup, shutdown, adjusting and balancing, and emergency procedures. Include all posted instruction charts.
- 4. Maintenance:
 - a. Parts list and parts number.
 - b. Maintenance, lubrication and replacement charts and Contractor's recommendations for preventative maintenance.
 - c. Trouble shooting charts for systems and components.
 - d. Instructions of testing each type of part.

- e. Recommended list of on-hand spare parts.
- f. Complete calibration instructions for all parts and entire systems.
- g. Instruction for charging, filling, draining and purging.
- h. General or miscellaneous maintenance notes.
- 5. Manufacturer's Literature:
 - a. Complete listing for all parts with names, addresses and telephone numbers.
 - b. Care and operation.
 - c. All and only pertinent brochures, illustrations, drawings, cuts, bulletins, technical data, certified performance charts and other literature with the model actually furnished to be clearly and conspicuously identified.
 - d. Internal wiring diagrams and engineering data sheets for all items and/or equipment to be furnished.
 - e. Guarantee and warranty data.
- 6. Instructions for lubricating each piece of equipment installed. Instructions shall state type of lubricant, where and how frequently lubrication is required.

Frame all instructions under glass and hang in the Mechanical Room <u>or</u> other location as directed by Construction Manager.

C. MANUALS FOR PRODUCTS, MATERIALS, AND FINISHES:

- 1. Submit three (3) copies of complete manual.
- 2. Content: Provide complete information for architectural products, applied materials, and finishes.
 - a. Manufacturer's data, including catalog number, size, composition, color and texture designations, and information for reordering.
 - b. Instructions for care and maintenance, including manufacturer's recommendations for cleaning agents and methods; cautions against detrimental cleaning agents and methods; and recommended schedule for cleaning and maintenance.

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of selected portions of a building or structure.
 - 2. Salvage of selected building components and elements.
 - 3. Repair procedures for selective demolition operations.
- B. Related Sections include the following:
 - 1. Division 01 General Requirements for temporary construction and environmental-protection measures for selective demolition operations.
 - 2. Division 01 General Requirements for cutting and patching procedures for selective demolition operations.
 - 3. Selective removal and replacement of brick and cast stone at exterior walls is specified in Division 04 Section "Masonry Replacement Work."

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with

project names and addresses, names and addresses of architects and owners, and other information specified.

- B. Proposed Dust-Control, Noise-Control and Other Special Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
- C. 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.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
- D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- E. Predemolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Professional Engineer Qualifications: Comply with Division 01 General Requirements.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 01 General Requirements.

1.6 PROJECT CONDITIONS

- A. Owner will occupy portions of site and buildings immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 2 weeks' notice to Owner of activities that will affect Owner's operations.
- B. Owner may elect to salvage certain items from areas of construction other than those indicated on Drawings as "salvage" prior to selective demolition operations. Give 2 weeks

notice to Owner prior to commencing any selective demolition processes to allow for Owner salvage operations.

- C. Maintain access to existing walkways, roadways, and other adjacent occupied or used facilities.
 - 1. Do not close or obstruct walkways, roadways, or other occupied or used facilities without written permission from authorities having jurisdiction.
- D. Owner assumes no responsibility for condition of areas to be selectively demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- E. Hazardous Materials: Remediation of existing hazardous materials, if any, will be completed prior to commencement of selective demolition in the areas where hazardous materials are present.
 - 1. If materials suspected of containing hazardous materials that have not been previously identified in the Contract Documents are encountered, do not disturb; immediately notify Architect and Owner.
 - 2. A hazardous materials report is included in the Specifications for information only.
- F. Storage or sale of removed items or materials on-site will not be permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 - PRODUCTS

- 2.1 REPAIR MATERIALS
 - A. Use repair materials identical to existing materials.
 - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. Use materials whose installed performance equals or surpasses that of existing materials.
 - B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
 - 1. Provide at least 2 weeks' notice to Owner if shutdown of service is required during changeover.
- C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
 - 4. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

- A. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- 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.

- 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
- C. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent site improvements, structures 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. Provide special protection measures as required by Owner.
- D. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects
- E. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
- F. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction 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.

3.4 POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
 - 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: 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.

3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. 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, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain 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.
 - 10. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Removed and Salvaged Items: Comply with the following:
 - 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.

- C. Removed and Reinstalled Items: Comply with the following:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Salvage items indicated on the Drawings as "salvage".
- E. Existing Facilities: Comply with Owner's requirements for using and protecting elevators, stairs, walkways, building entries, and other building facilities during selective demolition operations.
- F. 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.
- G. Concrete: Demolish in small sections. Cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.
- H. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- I. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- J. Air-Conditioning Equipment: Remove equipment without releasing refrigerants.
- 3.6 PATCHING AND REPAIRS
 - A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
 - B. Patching: Comply with Division 01 Section "Cutting and Patching."
 - C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
 - 1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.

- D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.
- E. Floors and Walls: Where walls or partitions that are demolished 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.
 - 1. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
 - 2. Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.
 - 3. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
- F. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
- G. Roof Coverings: Patch and repair existing roof covering system to match existing construction and to provide a watertight finished roof covering. If roof system is still under warranty, work must be performed by roof system manufacturer's approved and certified installer in accordance with all roof manufacturer's requirements to maintain warranty.
- 3.7 DISPOSAL OF DEMOLISHED MATERIALS
 - A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
 - B. Burning: Do not burn demolished materials.
 - C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - e. Special concrete finish Subcontractor.
 - 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, vapor-retarder installation, anchor rod and anchorage device

installation tolerances, steel reinforcement installation, methods for achieving specified floor and slab flatness and levelness floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. 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.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Waterstops.
 - 6. Curing compounds.
 - 7. Vapor retarders.
 - 8. Semirigid joint filler.
 - 9. Repair materials.
- B. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates.
- C. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
- D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- E. Field quality-control reports.

F. Minutes of preinstallation conference.

1.7 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.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. 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.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.9 FIELD CONDITIONS

- A. 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.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, 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.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. 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 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.

2.4 CONCRETE MATERIALS

A. 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.

- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type I/II.
 - 2. Fly Ash: ASTM C 618, Class F.
 - 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
 - 4. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C 260/C 260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM 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. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- F. Water: ASTM C 94/C 94M and potable.

2.5 WATERSTOPS

- A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. <u>Barrier-Bac; Inteplast Group, Ltd</u>.
 - b. Carlisle Coatings & Waterproofing Inc.
 - c. Sika Greenstreak.

2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.

- 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Barrier-Bac; Inteplast Group, Ltd.
 - b. Raven Industries, Inc.
 - c. <u>Reef Industries, Inc</u>.

2.7 CURING MATERIALS

- A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- B. Water: Potable.
- C. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. <u>Anti-Hydro International, Inc</u>.
 - b. BASF Corp. Construction Chemicals.
 - c. Euclid Chemical Company (The); an RPM company.
 - d. W.R. Meadows, Inc.

2.8 RELATED MATERIALS

- A. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 according to ASTM D 2240.
- B. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- C. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.9 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

- 2. Primer: Product of underlayment 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 underlayment manufacturer.
- 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. 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.
 - 1. Cement Binder: ASTM C 150/C 150M, 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.
- 2.10 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.
 - 2. Combined Fly Ash and Pozzolan: 25 percent.
 - 3. Slag Cement: 50 percent.
 - 4. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
 - 5. Silica Fume: 10 percent.
 - 6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
 - 7. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
 - C. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 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 concrete, as required, for placement and workability.
- 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
- 2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS As indicated on drawings.
- 2.12 FABRICATING REINFORCEMENT
 - A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
- 2.13 CONCRETE MIXING
 - A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, 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 FORMWORK INSTALLATION
 - 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.
 - D. Construct forms tight enough to prevent loss of concrete mortar.

- E. Construct 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.

3.2 EMBEDDED ITEM INSTALLATION

- 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 303.
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.

3.3 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 support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
- 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not 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.

3.4 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.5 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- 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.

- 3.6 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 beamgirder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least Insert depth of concrete thickness as follows:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
 - D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.7 WATERSTOP INSTALLATION

A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. 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 not to 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.
- 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.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

- 1. Apply to concrete surfaces not exposed to 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. Repair 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 view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where exposed to view:
 - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- D. 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 trowel finish.
- 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 or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 - 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
 - a. 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.

- D. Broom Finish: Apply a broom finish to exterior concrete 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.

3.11 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- 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 in-place 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.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

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 305.1 for hot-weather protection during curing.
- B. 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.
- C. 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 remainder of curing period.

- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moistureretaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
 - 3. 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 repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

3.13 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. 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. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing 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. Repair 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.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.
 - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 - 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

- 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
- 6. Repair 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. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Steel reinforcement welding.
 - 3. Headed bolts and studs.
 - 4. Verification of use of required design mixture.
 - 5. Concrete placement, including conveying and depositing.
 - 6. Curing procedures and maintenance of curing temperature.
 - 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

- 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
- 2. Slump: ASTM 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.
- 3. Air Content: ASTM C 231/C 231M, 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.
- 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
- 5. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
- 6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratorycured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. 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.
- 7. 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.
- 8. 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.
- 9. 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.
- 10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- 11. 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.

- 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.16 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch (6 mm).
 - 2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
 - 3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/4 inch (6 mm).
 - 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch (25 mm).
 - 5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch (6 mm).
 - 6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch (13 mm).
 - 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches (6 mm per 300 mm).
 - 8. Joint Spacing: 3 inches (75 mm).
 - 9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
 - 10. Joint Width: Plus 1/8 inch (3 mm), no minus.

END OF SECTION 033000

SECTION 035416 - HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes hydraulic-cement-based underlayment for use below interior floor coverings.
- 1.2 SUBMITTALS
 - A. Product Data: For each type of product indicated.
 - B. Shop Drawings: Plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.
 - C. Manufacturer Certificates: Signed by manufacturers of both underlayment and floor covering system certifying that products are compatible.
 - D. Qualification Data: For Installer.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.
- B. Product Compatibility: Manufacturers of both underlayment and floor covering system certify in writing that products are compatible.
- C. Mockups: Apply hydraulic-cement-based underlayment mockups to demonstrate surface finish, bonding, texture, tolerances, and standard of workmanship.
 - 1. Apply mockups approximately 100 sq. ft. (9 sq. m) in area in location indicated or, if not indicated, as directed by Architect.
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 00.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.
- 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature and humidity, ventilation, and other conditions affecting underlayment performance.
 - 1. Place hydraulic-cement-based underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg F (10 and 27 deg C).
- 1.6 COORDINATION
 - A. Coordinate application of underlayment with requirements of floor covering products, including adhesives, specified in Division 09 Sections, to ensure compatibility of products.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Ardex, Inc.; K-15 Self-Leveling Underlayment Concrete.
 - 2. Dayton Superior Specialty Chemical Corp.; Level Layer I
 - 3. Mapei Corporation; Ultraplan I Plus

2.2 HYDRAULIC-CEMENT-BASED UNDERLAYMENTS

- A. Underlayment: Hydraulic-cement-based, polymer-modified, self-leveling product that can be applied in minimum uniform thicknesses of 1/8 inch (3 mm) and that can be feathered at edges to match adjacent floor elevations. Product shall also be capable of being poured/pumped monolithically (rather than room-by-room).
 - 1. Cement Binder: ASTM C 150, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C 219.
 - 2. Compressive Strength: Not less than 4100 psi (28 MPa) at 28 days when tested according to ASTM C 109/C 109M.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm); or coarse sand as recommended by underlayment manufacturer.
 - a. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required
 - 4. Water: Potable and at a temperature of not more than 70 deg F (21 deg C).
- B. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for conditions affecting performance.
 - 1. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Prepare and clean substrate according to manufacturer's written instructions.
 - 1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
 - 2. Fill substrate voids to prevent underlayment from leaking.
- B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond. Perform moisture tests recommended by manufacturer and as follows.
 - 1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/100 sq. m) in 24 hours.
 - 2. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have relative humidity level measurement acceptable to manufacturer.
- C. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.
- D. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 APPLICATION

- A. General: Mix and apply underlayment components according to manufacturer's written instructions.
 - 1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
 - 2. Coordinate application of components to provide optimum underlayment-to-substrate and intercoat adhesion.
 - 3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
 - 4. Install perimeter isolation strip along the base of partitions prior to installation of topping. Cut isolation strip flush with finished floor.
 - 5. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- B. Apply underlayment to produce uniform, level surface.

- 1. Apply a final layer without aggregate to produce surface.
- 2. Feather edges to match adjacent floor elevations.
- C. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- D. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.
- E. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.
- 3.4 PROTECTION
 - A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 035416

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes unit masonry assemblies consisting of the following:
 - 1. Concrete masonry units. (CMU)
 - 2. Mortar and grout.
 - 3. Reinforcing steel.
 - 4. Masonry joint reinforcement.
 - 5. Ties and anchors.
 - 6. Miscellaneous masonry accessories.
 - B. Products installed, but not furnished, under this Section include the following:
 - 1. Hollow-metal frames in unit masonry openings, furnished under Division 08 Section "Hollow Metal Doors and Frames."

1.2 DEFINITIONS

- A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.
- 1.3 PERFORMANCE REQUIREMENTS
 - A. Provide unit masonry that develops net-area compressive strengths (f'_m) at 28 days as indicated in unit masonry performance requirements on the Drawings.
- 1.4 ACTION SUBMITTALS
 - A. Product Data: For each different masonry unit, mortar material, accessory, and other manufactured product specified.
 - B. Shop Drawings: Show fabrication and installation details for the following:
 - 1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.
- 1.5 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
 - B. Material Test Reports: From a qualified testing agency indicating and interpreting test results of the following for compliance with requirements indicated:
 - 1. Each type of masonry unit required.
 - 2. Mortar complying with property requirements of ASTM C 270.

- 3. Grout mixes complying with compressive strength requirements of ASTM C 476. Include description of type and proportions of grout ingredients.
- C. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Each type of masonry unit required.
 - 2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
 - 3. Each type and size of joint reinforcement.
 - 4. Each type and size of anchor, tie, and metal accessory.
- 1.6 QUALITY ASSURANCE
 - A. Masonry Standard: Comply with requirements of "Specifications for Masonry Structures, ACI 530.1/ASCE 6/TSM 602" published by the American Concrete Institute, except when more stringent requirements are specified and as modified by the requirements of these Contract Documents.
 - 1. Revise ACI 530.1/ASCE 6/TSM 602 to exclude Article 1.5; Subparagraphs 1.1 C.1 through 4, and Subparagraphs 3.3 E.1 through 5.
 - B. Installer Qualifications: Engage an experienced installer who has 10 years experience as a journeymen mason, and who has completed masonry similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
 - 1. A minimum of one skilled journeyman mason shall be present at all times during masonry erection and shall personally direct the work.
 - C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.
 - D. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
 - E. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
 - F. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
- 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 PROJECT 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.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three (3) 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 coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 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 Part 1.8 C. of ACI 530.1/ASCE 6/TMS 602.
 - 1. Do not lay masonry units that are wet or frozen.
 - 2. Remove masonry damaged by freezing conditions.
- E. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

- F. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Comply with cold-weather construction requirements contained in Part 1.8 D. of ACI 530.1/ASCE 6/TMS 602. Provide artificial shade and wind breaks and use cooled materials as required.
 - 1. When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.
- 1.9 SPECIAL INSPECTIONS
 - A. The Owner will engage the services of a qualified Special Inspector for this project. The Special Inspector will provide and/or coordinate inspection and testing requirements as necessary in accordance with the provisions of the Statement of Special Inspections Form contained in these Specifications.
- PART 2 PRODUCTS
- 2.1 CONCRETE MASONRY UNITS
 - A. General: Provide shapes indicated and as follows:
 - 1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 - 2. Provide bullnose units for outside corners that are exposed to view, unless otherwise indicated.
 - B. Concrete Masonry Units (CMU): ASTM C 90 with minimum average net-area compressive strength of 1900 psi; lightweight; and as follows:
 - 1. Size: Manufactured to the following dimensions: 16 inches (407 mm) by 8 inches (203 mm) nominal; 7-5/8 inches (194 mm) by 15-5/8 inches (397 mm) actual; by thickness indicated.
 - 2. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
 - 3. Provide U.L. classified units for rated walls, or units meeting the fire resistance ratings by equivalent concrete masonry thickness.

2.2 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for coldweather construction. Provide natural color cement.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

- D. Masonry Cement: Not permitted.
- E. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
- F. Aggregate for Grout: ASTM C 404.
- G. Water: Potable.
- 2.3 REINFORCING STEEL
 - A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).
- 2.4 MASONRY JOINT REINFORCEMENT
 - A. General: ASTM A 951 and as follows:
 - 1. Mill galvanized, carbon-steel wire for interior walls, unless noted below.
 - 2. Hot-dip galvanized, carbon-steel wire for exterior walls and interior walls at Basement locations.
 - 3. Wire Size for Side Rods: W1.7 or 0.148-inch (3.8-mm) diameter.
 - 4. Wire Size for Cross Rods: W1.7 or 0.148-inch (3.8-mm) diameter.
 - 5. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units where indicated.
 - B. For single-wythe masonry, provide ladder type with single pair of side rods and cross rods spaced not more than 16 inches (407 mm) o.c.
- 2.5 TIES AND ANCHORS, GENERAL
 - A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.
 - B. Mill Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 641 (ASTM A 641M), Class 1 coating.
 - C. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
 - D. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbonsteel sheet hot-dip galvanized after fabrication to comply with ASTM A 153
 - E. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- 2.6 JOINT STABILIZATION ANCHORS
 - A. General: Contractor's option to select between the two types listed below.

- B. Three-piece assemblies allowing movement at expansion, contraction or isolation joint while maintaining wall alignment in direction normal to the movement. Two 3/16-inch (4.8-mm) diameter wire rods with plastic sleeves separating two 1/32-inch (0.8-mm) sheet metal sleeves for embedding completely in mortar, zinc plated; Hohmann & Barnard "Slip-Set Stabilizer" or equivalent.
- C. Galvanized 3/8-inch (9-mm) by 6 inches (150 mm) steel dowel vertically welded to a 2-inch (50-mm) by 5-inch (125-mm) steel plate with slotted holes for mounting to the underside of beams or deck, and a plastic sleeve with compressible filler to prevent dowel from bonding with mortar; Hohmann & Barnard PTA-420 with tube or equivalent.

2.7 RIGID ANCHORS

- A. General: Fabricate from steel bars as follows:
 - 1. 1-1/2 inches (38 mm) wide by 1/4 inch (6.4 mm) thick by 24 inches (600 mm) long, with ends turned up 2 inches (50 mm) or with cross pins.
 - 2. Finish: Hot-dip galvanized to comply with ASTM A 153.

2.8 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
 - 1. Headed bolts.
- B. Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Type: Chemical anchors.
 - 2. Type: Expansion anchors.
 - Corrosion Protection (Indoor): Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
 - 4. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Alloy Group 1 or 4) for bolts and nuts; ASTM A 666 or ASTM A 276, Type 304 or 316, for anchors.
 - 5. For Postinstalled Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.
 - 6. For Postinstalled Anchors in Grouted Masonry Units: Capability to sustain, without failure, a load equal to six times the loads imposed.

2.9 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.
- B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated, or required.
 - 1. Styrene-Butadiene-Rubber Compound: ASTM D 2000, Designation M2AA-805.
 - 2. Product: Hohmann & Barnard, Inc., RS Series or equal.
- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.10 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
 - 1. Products for Cleaning Unit Masonry: Subject to compliance with requirements, provide one of the following:
 - a. Cleaners for Red and Light-Colored Brick Not Subject to Metallic Staining with Mortar Not Subject to Bleaching: Sure Klean No. 600 Detergent; ProSoCo, Inc.
 - b. Cleaners for Red and Dark-Colored Brick Not Subject to Metallic Staining: Sure Klean No. 101 Lime Solvent; ProSoCo., Inc.
 - c. Cleaners for Brick Subject to Metallic Staining: Sure Klean Vana Trol; ProSoCo, Inc.

2.11 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.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the 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, Proportion Specification.
 - 1. Limit cementitious materials in mortar to portland cement and lime.
 - 2. For masonry below grade, in contact with earth, and where indicated, use Type M.

- 3. For reinforced masonry, shear walls, exterior above-grade load-bearing and exterior above-grade non-load-bearing walls, interior load-bearing walls, parapet walls, and where indicated, use Type N.
- 4. For interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
- 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 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143.
- PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify that foundations are within tolerances specified.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.
- 3.2 INSTALLATION, GENERAL
 - A. For cold-weather construction comply with requirements contained in ACI 530.1-05
 - B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.
 - C. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.
 - D. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.
 - E. Cut masonry units with motor-driven saws to provide clean, sharp, un-chipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 CONSTRUCTION TOLERANCES

- A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:
- B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.
- C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.
- D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, the following tolerances will apply.
 - 1. Variation from Plumb: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m) or 1/4 inch in 20 feet (6 mm in 6 m) or more.
 - 2. Variation from Level: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 3/8 inch (9 mm) maximum.
 - 3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less.
 - 4. Variation in Plane between Adjacent Surfaces (Lipping): Do not exceed 1/16inch (1.5-mm) difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.
- E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
- F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).

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: Lay exposed masonry in running bond pattern unless otherwise indicated; do not use units with less than nominal 4-inch (100-mm) 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 (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: In each course, rack back one-half-unit length for onehalf running bond or one-third-unit length for one-third running bond; do not tooth.

Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.

- E. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- F. Fill space between hollow-metal 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 in the joint below and rod mortar or grout into core.
- H. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated, and at all exterior wall locations.
- I. Build non-load-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. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 07 Section "Firestopping."

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
- B. Lay solid brick-size 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 the joint thickness, unless otherwise indicated.

3.6 MASONRY JOINT REINFORCEMENT

- A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
 - 1. Space reinforcement not more than 16 inches (406 mm) o.c.

- 2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
- 3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings.
 - a. Reinforcement above is in addition to continuous reinforcement.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 CONTROL AND EXPANSION JOINTS

- A. General: Install vertical control and expansion joints at one side of all doorways and at wall locations maximum 25 ft. o.c., and where indicated. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
- B. Form control joints in concrete masonry with preformed control-joint gaskets designed to fit standard sash block.
- C. Build in horizontal, pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 07 Section "Joint Sealants."

3.8 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.
 - 1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.
- C. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

3.9 REINFORCED UNIT MASONRY INSTALLATION

- A. General: Provide reinforced unit masonry walls at all walls as indicated.
- B. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

- 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
- 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- C. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- D. 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 ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.10 FIELD QUALITY CONTROL

- A. Inspectors: Owner will engage qualified certified testing agency to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.
 - 1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.
 - 2. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.
- B. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. (465 sq. m) of wall area or portion thereof.
- C. Mortar Test (Property Specification): For each mix provided, per ASTM C 780. Test mortar for mortar air content and compressive strength
- D. Grout Test (Compressive Strength): For each mix provided, per ASTM C 1019.
- 3.11 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.
 - 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, polyethylene film, or waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
 - 5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

END OF SECTION 042000

SECTION 042120 - MASONRY REPLACEMENT WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes:
 - 1. Unit replacement of damaged or deteriorated brick units at exterior walls, to match existing.
 - 2. Removing and resetting displaced existing cast stone units at exterior walls.
 - 3. Dismantling and rebuilding cast stone units where existing construction is required to be removed to repair steel framing members.
- B. Related Work Specified elsewhere:
 - 1. Cleaning masonry is specified in Division 04 Section "Masonry Cleaning."
 - 2. Pointing mortar and repointing masonry are specified in Division 04 Section "Masonry Repointing."
 - 3. Cast stone units used in masonry replacement work is specified in Division 04 Section "Cast Stone."
- 1.2 ACTION SUBMITTALS
 - A. Mortar Analysis: Provide a mortar analysis of existing original bedding mortar to be matched.
 - 1. Analysis shall be by an architectural conservation laboratory having 10 years of experience, including at least 5 historic preservation projects of similar size, scope and complexity, and shall be approved by the Architect.
 - 2. Analysis shall include, but not be limited to, color of mortar sample, composition of mortar, including ratio of sand to cement in percentage format as well as strength and hardness, and color, size and distribution of sand grains. Furnish color keyed to standard color system.
 - 3. Provide mortar analysis of bedding mortar with samples taken from the exact location as directed by Architect.
 - B. Mixes: Submit proposed mixes for each type of mortar and grout required, indicating materials and proportions to be used.
 - C. Product Data: For each different masonry unit, mortar ingredient, accessory, and other manufactured product specified.
 - D. Samples for Verification: For the following:
 - 1. Full-size brick units. Provide sets for each color and texture of brick required. Include 2 or more samples in each set showing the full range of variations expected

in these characteristics.

- 2. Existing Mortar: Submit 0.3 cubic inch sample of original mortar and 0.3 cubic inch sample of original sand for each type and color of bedding mortar to be matched.
- 3. Each type of sand proposed for use in bedding mortar.
 - a. For blended sands, provide samples of each component and blend.
 - b. Identify sources, both supplier and quarry, of each type of sand.
- 4. Each type of bedding mortar proposed for use in the form of sample mortar strips, 6 inches (150 mm) long by 1/2 inch (13 mm) wide, set in aluminum or plastic channels. Provide samples for each mortar color required, showing the full color range expected in the finished construction
 - a. Include with each sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.
 - b. Make samples using the same sand and mortar ingredients to be used on Project. Label samples to indicate type and amount of colorant used.
 - c. Reformulate and resubmit until match is approved by Architect.
- E. Shop Drawings: Indicating replacement work for masonry elements.
 - 1. Include plans, elevations, sections, and locations of replacement brick and stone units on the structure and their jointing, showing relation of existing and new or reset units.
 - 2. Show provisions for expansion joints or other sealant joints.
 - 3. Show replacement anchors, including drilled-in pins. Include details of anchors within individual masonry units, with locations of anchors and dimensions of holes and recesses in masonry required for anchors, including direction and angle of holes for pins.
- F. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Each cement product required for mortar, including name of manufacturer, brand, type, and weight slips at time of delivery.
- G. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
- 1.4 QUALITY ASSURANCE
 - A. Source Limitations for Brick: Obtain all brick from single source with resources to provide materials of consistent quality in appearance and physical properties without delaying the

work.

- B. Source Limitations for Mortar Materials: Obtain all mortar materials from single source with resources to provide materials of consistent quality in appearance and physical properties without delaying the work.
- C. Single Source Responsibility for Installation of Masonry Work: All masonry work of this section shall be performed by a single firm meeting qualifications specified in this section.
- D. Installer Qualifications for Masonry Replacement Work: Work must be performed by a firm having not less than five (5) years successful experience in comparable masonry replacement work including work on at least three (3) buildings listed in the National Register of Historic Places under the direction of federal and state preservation agencies in the last five years and employing personnel skilled in the installation processes and operations indicated.
 - 1. Only skilled journeymen masons who are thoroughly trained and experienced in performing masonry replacement work and installing replacement brick and cast stone units in existing construction, and completely familiar with the materials and methods required shall be used for the work.
 - 2. One skilled journeyman mason shall be present at all times during execution of the work and shall personally direct the work.
 - 3. In acceptance or rejection of masonry replacement work, no allowance will be made for lack of skill on the part of the workmen
- E. Mockups: Before beginning masonry replacement work, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Final approval of exposed mortar color and texture, mortar tooling, and brick and cast stone replacement work will be made based on acceptance of mock-ups. Build mockups to comply with t he following requirements, using materials indicated for the completed Work:
 - 1. Locate mockups in the locations as directed by Architect.
 - 2. Prepare mock-ups by demonstrating removal techniques on existing masonry units to be replaced and also insertion of replacement masonry units in wall construction.
 - 3. Provide the following mockups:
 - a. Prepare a mock-up of typical cast stone replacement work consisting of removing and resetting cast stone at one typical lintel replacement. Include all flashings and replacement anchors in the mock-up.
 - b. Prepare a mockup of typical unit brick replacement in exterior wall.
 - 4. Protect accepted mockups from the elements with weather-resistant membrane.
 - 5. Mock-ups shall demonstrate match to existing brickwork and cast stone work.
 - 6. Approved mock-ups may become part of the final work upon acceptance by Architect.
 - 7. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store and handle masonry and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, or other causes.

1.6 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in Part 1.8 C. of ACI 530.1/ASCE 6/TMS 602.
 - 1. Do not lay masonry units that are wet or frozen.
 - 2. Remove masonry damaged by freezing conditions.
- B. Hot-Weather Requirements: Protect masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Comply with cold-weather construction requirements contained in Part 1.8 D. of ACI 530.1/ASCE 6/TMS 602. Provide artificial shade and wind breaks and use cooled materials as required.
 - 1. When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.
- C. Coordination of Work:
 - 1. Submit samples of exterior exposed brick for Architect approval only cleaning a small area of existing brick to ensure new brick matches color and texture of existing brick on building.

1.7 SEQUENCING AND SCHEDULING

- A. Perform masonry replacement work in the following sequence, unless otherwise indicated or approved:
 - 1. Clean existing masonry.
 - 2. Replace existing masonry with new masonry materials.
 - 3. Rake out joints that are to be repointed.
 - 4. Point mortar joints.

PART 2 - PRODUCTS

- 2.1 BRICK
 - A. Replacement Face Brick: ASTM C 216, Grade SW, Type to match all characteristics of

existing brick and as follows:

- 1. Color and Texture: Match existing brick.
- 2. Size and Shape: Match existing.

2.2 CAST STONE

- A. Existing Cast Stone: Reuse existing cast stone where indicated.
- B. New Cast Stone: New cast stone is specified in Section 047200.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
 - 1. Provide natural color or white cement as required to produce required mortar color
- B. Hydrated Lime: ASTM C 207, Type S, formed into lime putty, or pulverized quicklime, thoroughly slaked and left standing for 72 hours after slaking.
- C. Masonry Cement: Not permitted.
- D. Aggregate for Mortar: Clean, fine, natural bank silica sand free from excessive organic or deleterious matter and graded in compliance with ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 1. For colored mortar, provide natural sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
 - 2. Provide sand of special grade as required to produce mortar matching texture of original mortar.
- E. Aggregate for Grout: ASTM C 404.
- F. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars
- G. Water: Potable.

2.4 MORTAR MIXES

- A. Measurement and Mixing: Measure lime and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
- B. Colored Mortar: Produce mortar of color to match existing by using selected ingredients. Do not alter specified proportions without Architect's approval.

- 1. Use naturally colored aggregates to produce required mortar color to greatest extent possible, before adding pigments.
- 2. Pigments: Where mortar pigments are used, do not exceed a pigment-to-cement ratio of 1:10 by weight.
- C. Do not use admixtures of any kind in mortar, unless otherwise indicated.
- D. Color and Texture of Mix: Provide mortar in colors and textures to match existing mortar in cast stone work and in brick work. Two different mixes may be required.
- E. Mortar Proportions: Mix mortar materials in the following proportions:
 - 1. Match existing formulation for each different masonry material. Up to two mixes may be required
- 2.5 EMBEDDED FLASHING MATERIALS
 - A. Concealed Adhered Masonry Flashing: Provide rubberized sheet flashing overlapping a full bed depth stainless steel drip as follows:
 - 1. Basis of Design Products: Provide specified products of GCP Applied Technologies, or equal products by Hohmann & Barnard or Heckmann.
 - 2. Sheet-Metal Drip Flashing: Fabricate from 22 gage stainless steel with the drip edge hemmed approximately 3/16-inch and a 2 inch turn-up, as indicated on Drawings.
 - 3. Rubberized Asphalt Sheet Flashing: Manufacturer's standard composite flashing product consisting of a pliable and highly adhesive rubberized asphalt compound, 32 mils (0.8 mm) thick, bonded completely and integrally to a high-density, cross-laminated polyethylene film, 8 mils (0.2 mm) thick, to produce an overall thickness of 40 mils (1.0 mm); Perm-A-Barrier Wall Flashing by GCP Applied Technologies or equivalent. Verify compatibility with air barrier system that sheet flashing contacts
 - a. Primer: Flashing manufacturer's standard product or product recommended by flashing manufacturer for bonding flashing sheets to masonry and concrete; Bituthene P-3000 Primer by GCP Applied Technologies or equivalent.
 - b. Surface Conditioner: Latex-based, water-dispersible liquid for substrate preparation. Water solvent type. Perm-A-Barrier Surface Conditioner manufactured by GCP Applied Technologies or equivalent.
 - c. Termination Mastic: Rubberized asphalt-based mastic with 200 grams/liter max VOC content. Bituthene Mastic by GCP Applied Technologies, or equivalent.
 - B. Metal Flashing: Provide metal flashing as follows:
 - 1. Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch (0.40 mm) thick.
- 2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. Anchors and Pins: Mechanical anchors, fasteners and pins of Type 304 stainless steel, matching type, shape and size of existing anchors.
- B. Epoxy Adhesive for Pinning Stones: Two-part polyester or epoxy-resin stone adhesive with a 15- to 45-minute cure at 70 deg F (21 deg C), recommended in writing by adhesive manufacturer for type of stone repair indicated, and matching stone color.
 - 1. Available Products:
 - a. Akemi North America; Akepox Series
 - b. Bonstone Materials Corporation; Clear Gel Epoxy
 - c. Edison Coatings, Inc.; Flexi-Weld 520T

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive masonry replacement work and conditions under which masonry replacement work will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the work.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 REMOVAL OF MASONRY UNITS

- A. Carefully remove existing units to be replaced, without causing damage to adjacent areas. Do not spall or in any other way damage the faces or edges of the masonry units being removed and reset.
 - 1. Hand tools or professional pneumatic stone cutting tools specially designed for mortar removal and masonry restoration (manufactured by Trow & Holden Co., Barre, Vt. or equal) only shall be used for removal of masonry units.
 - 2. When permitted by Architect, and based on acceptance of mock-up techniques for brick replacement work, saw cutting down the center of the bed joint in brickwork prior to hand tool use may be performed.
 - 3. No other power tools will be permitted during this procedure.
- B. Remove all mortar from the surfaces of the masonry units to be reset so that new mortar bonds to masonry and not to old mortar.

3.3 PREPARATION

- A. Clean masonry units prior to setting, leaving edges and surfaces free of dirt and foreign material
- B. Brick: Soak units in a vat or box of clean water for one hour or more just prior to installation. Units shall be noticeably damp at the time of setting. Units shall be drained

sufficiently to eliminate surface water.

- C. Fill in void spaces in back-up masonry and paint existing steel members. Carefully examine substrate construction before installing the work; correct as necessary to provide a plumb and true substrate to accommodate a proper installation of the replacement masonry units. Install new back-up masonry as required. Install replacement masonry ties and anchors when existing anchors and ties are damaged, deteriorated or missing.
- D. Where lintels are being replaced, coordinate removal and resetting of cast stone units at lintels with lintel replacement work.
- 3.4 SETTING OF MASONRY, GENERAL
 - A. Arrange new masonry units for accurate fit in original bonding pattern.
 - B. Set masonry units to comply with approved Shop Drawings and mock-ups. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure masonry units in place. Set units accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.
 - C. Set masonry units in solid mortar bed. Fill all spaces between masonry and substrate with mortar. Provide teflon shims or wood to set depth of joint, removing shims after mortar has set.
 - D. Maintain uniform joint widths except for variations due to different masonry sizes and where minor variations are required to maintain bond alignment, if any.
 - 1. Lay walls with joint widths to match original joint widths.
 - E. Provide expansion, control, and pressure-relieving joints of widths and at locations as required.
 - 1. Keep expansion and pressure-relieving joints free of mortar and other rigid materials.
 - 2. Sealing expansion, control, and pressure-relieving joints is specified in Division 07 Section "Joint Sealants."
 - F. Contiguous Work: Provide openings as required to accommodate contiguous work.
 - G. As work progresses, install built-in flashings and sheet metal as indicated on approved shop and setting drawings. Seal penetrations in flashing using mastic.
 - H. Rake out mortar and point joints as specified in Division 04 Section "Masonry Repointing."
 - I. Tool exposed joints to a smooth profile when thumbprint hard, using a jointer larger than the joint thickness, to match approved mock-ups. Match existing tooling profile.
- 3.5 ADJUSTING AND CLEANING

- A. Remove and replace masonry units of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged masonry unit. Stone may be repaired if methods and results are approved by Architect.
 - 2. Defective joints.
 - 3. Masonry not matching approved samples and mockups.
 - 4. Masonry not complying with other requirements indicated.
- B. Replace in a manner that results in masonry matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean masonry as work progresses. Remove mortar fins and smears before tooling joints.
- D. Clean masonry after mortar has had opportunity to cure, using clean water and stiff-bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning agents containing caustic compounds or abrasives, or other materials or methods that could damage masonry.

3.6 **PROTECTION**

A. Protection: Provide final protection that ensures masonry replacement work is without damage and deterioration at the time of final acceptance.

END OF SECTION 042120

SECTION 047200 - CAST STONE

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes the following:
 - 1. Cast stone lintels, pilasters, trim, caps, and other shapes indicated on drawings.
 - 2. Steel support and retention connections for cast stone, including all ties, anchors, and necessary shims to supporting structure.
 - B. Related Sections:
 - 1. Division 04 Section "Masonry Replacement Work" for bedding mortar and grout and for installation requirements relating to cast stone replacement
 - 2. Division 04 Section "Masonry Repointing" for pointing mortar.

1.2 DEFINITIONS

- A. Cast Stone: Architectural precast concrete building units intended to simulate natural cut stone.
- B. Arris: The sharp edge of a Cast Stone Unit.
- 1.3 ACTION SUBMITTALS
 - A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for cast stone units.
 - B. Design Mixes: For each different mix.
 - C. Shop Drawings: Detail fabrication and installation of cast stone units. Indicate member locations, plans, elevations, dimensions, shapes, cross sections, limits of each finish, and types of reinforcement, including special reinforcement, and lifting devices necessary for handling and erection.
 - 1. When cast stone is used for cast stone replacement work, include the following:
 - a. Each different shape to be provided for replacement units.
 - b. Plans, elevations, sections, and locations of replacement cast stone units on the structure and their jointing, showing relation of existing and new masonry units.
 - c. Details of surface finishing work for each cast stone unit replicating unit being replaced.
 - D. Samples for Initial Selection: For colored mortar, showing the full range of colors available.

- E. Samples for Verification:
 - 1. For each mortar color required, showing the full range expected in the finished construction. Make samples using the same sand and mortar ingredients to be used on Project. Label samples to indicate type and amount of colorant used.
 - 2. For each color and texture of cast stone required, 10-inches (250 mm) square in size.
- F. Full-Size Samples: For each type of cast stone unit required. Make available for Architect's review at Project site before installing cast stone.
 - 1. Approved Samples may be installed in the Work.
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For Fabricator and Installer.
 - B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of cast stone with requirements indicated.
 - C. Certification that the materials incorporated in this Work are free from hazardous contaminates.
- 1.5 QUALITY ASSURANCE
 - A. Installer Qualifications: Refer to requirements specified in Division 04 Section "Masonry Replacement Work". Installation of cast stone units shall be performed by the same entity performing masonry replacement work.
 - B. Fabricator Qualifications: A firm experienced in manufacturing cast stone units similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to manufacture required units.
 - 1. Fabricator is a producing member of the Cast Stone Institute
 - C. Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
 - D. Source Limitations for Cast Stone: Obtain cast stone units through one source from a single manufacturer.
 - E. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
 - F. Mock-ups: Provide mock-up as specified in Division 04 Section "Masonry Replacement Work".
- 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Pack, handle, and ship cast stone units in suitable packs or pallets.
 - 1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast stone units, if required, using dollies with wood supports.
 - 2. Store cast stone units on wood skids or pallets with nonstaining, waterproof covers. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.
- B. Store installation materials on elevated platforms, under cover, and in a dry location.
- C. Store mortar aggregates where grading and other required characteristics can be maintained and contamination avoided.
- 1.7 COORDINATION
 - A. Coordinate production and delivery of cast stone with masonry replacement work to minimize the need for on-site storage and to avoid delaying the Work.
 - B. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Provide products of Continental Cast Stone Manufacturing, Inc. or equal products manufactured by one of the following
 - 1. Arriscraft
 - 2. American ArtStone.
- 2.2 CAST STONE MATERIALS
 - A. General: Comply with ASTM C 1364 and the following:
 - B. Portland Cement: ASTM C 150, Type I, containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
 - C. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C 33; gradation as needed to produce required textures.
 - D. Fine Aggregates: Manufactured or natural sands complying with ASTM C 33, gradation as needed to produce required textures.
 - E. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored waterreducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

- F. Reinforcement: Deformed steel bars complying with ASTM A 615/A 615M.
 - 1. Epoxy Coating: ASTM A 775/A 775M.
 - 2. Galvanized Coating: ASTM A 767/A 767M.
- G. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A 276 or ASTM A 666, Type 304.
- 2.3 STAINLESS-STEEL SUPPORT AND CONNECTION MATERIALS
 - A. Anchors: Type and size indicated, fabricated from stainless steel complying with ASTM A 276 or ASTM A 666, Type 304.
 - 1. For connecting cast stone to stainless steel tube reinforcing provide Hohmann & Barnard 360 Grip Stay channel slot welded to steel column and 365 Bent Grip Stay Channel Slot anchor to tie the cast stone to the stainless steel tube, or equal.
 - B. Dowels: Round stainless-steel bars complying with ASTM A 276, Type 304, 1/2-inch (12-mm) diameter
 - C. Accessories: Provide clips, hangers, plastic shims, and other accessories required to install cast stone units.
- 2.4 CAST STONE FABRICATION
 - A. Provide cast stone units complying with ASTM C 1364.
 - 1. Provide units that are resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666, Procedure A, as modified by ASTM C 1364.
 - B. Physical Properties:
 - 1. Compressive Strength: Minimum 6,500 psi when tested per ASTM C 1194.
 - 2. Absorption: Maximum 6% when tester per ASTM C 1195.
 - C. Reinforce units as indicated and as required by ASTM C 1364. Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches (38 mm) of material. Minimum coverage shall be twice the diameter of the bars.
 - 1. Area of reinforcement in panels greater than 12" wide shall be not less than 1/4 percent of the cross section area when steel is specified.
 - D. Fabrication Method: Use a Vibrant-Tamp placement method or machine manufacture using a zero slump mixture to achieve desired appearance and physical properties.
 - E. Fabricate units with sharp arris and details accurately reproduced with indicated texture on all exposed surfaces, unless otherwise indicated.

- 1. Slope exposed horizontal surfaces at least 1:12, unless otherwise indicated.
- 2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
- 3. Provide drips on projecting elements, unless otherwise indicated.
- F. Stone Replacement Units: Fabricate cast stone units to exactly replicate stone being replaced; comply with Division 04 Section "Masonry Replacement Work."
- G. Cure and finish units as follows:
 - 1. Cure units in totally enclosed curing room under dense fog and water spray at 95 percent relative humidity for 24 hours.
 - 2. Yard cure units until the sum of the mean daily temperatures for each day equals or exceeds 350 deg F.
 - 3. Acid etch units to remove cement film from surfaces indicated to be finished.
- H. Color and Texture: Exposed surfaces shall exhibit a fine-grained texture similar to natural stone; no bug-holes or air voids shall be permitted.
 - 1. Color and Texture: Color and texture shall match existing stone, after it has been cleaned (under Section 049100).
 - 2. Surface Finish Treatment: Finish surface of units to match existing stone units being replicated; provide stippling, brush hammered finish and chiseled features as required.
- 2.5 MORTAR MATERIALS
 - A. Bedding mortar materials are specified in Division 04 Section "Masonry Replacement Work."
 - B. Pointing mortar materials are specified in Division 04 Section "Masonry Repointing."
- 2.6 MISCELLANEOUS MATERIALS
 - A. Cast Stone Cleaner: Sure Kleen #600 by ProSoCo Products Inc., or equal.
- 2.7 MORTAR MIXES
 - A. Bedding mortar mix is specified in Division 04 Section "Masonry Replacement Work."
 - B. Pointing mortar mix is specified in Division 04 Section "Masonry Repointing."
- 2.8 SOURCE QUALITY CONTROL
 - A. Employ an independent testing agency to sample and test cast stone units according to ASTM C 1364.
 - 1. Include testing for freezing and thawing resistance.

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 cast stone.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION
 - A. General:
 - 1. Comply with Cast Stone Institute recommendation for installation of cast stone units.
 - 2. Comply with installation requirement specified in Division 04 Section "Masonry Replacement Work" for stone replacement work, as applicable.
 - B. Set cast stone as indicated on Contract Drawings. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place. Set units accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.
 - C. Drench units with clear water just before setting.
 - D. Set units in full bed of mortar with full head joints, unless otherwise indicated. Build anchors and ties into mortar joints as units are set.
 - 1. Fill dowel holes and anchor slots with mortar.
 - 2. Fill collar joint solid as units are set.
 - 3. Build concealed flashing into mortar joints as units are set.
 - 4. Leave head joints open in coping and other units with exposed horizontal surfaces. Keep joints clear of mortar, and rake out to receive sealant.
 - E. Rake out joints for pointing with mortar to depths of not less than 3/4 inch (19 mm). Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.
 - F. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch (10 mm). Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
 - G. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
 - H. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.
 - 1. Sealing joints is specified in Division 07 Section "Joint Sealants."

2. Keep joints free of mortar and other rigid materials.

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m) or 1/4 inch in 20 feet (6 mm in 6 m) or more.
- B. Variation from Level: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 3/8 inch (9 mm) maximum.
- C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less.
- D. Variation in Plane between Adjacent Surfaces (Lipping): Do not exceed 1/16-inch (1.5mm) difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.
- B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean cast stone as work progresses. Remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 - 4. Clean cast stone in conformance cleaner manufacturer's directions.

END OF SECTION 047200

SECTION 049100 - MASONRY CLEANING

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes masonry cleaning as follows:
 - 1. Cleaning stone steps surfaces.
 - 2. Cleaning exposed cast stone surfaces.
 - 3. Cleaning a small area of brickwork for purposes of color matching for replacement brick.

1.2 DEFINITIONS

- A. Low-Pressure Spray: 100 to 400 psi (690 to 2750 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).
- B. Medium-Pressure Spray: 400 to 800 psi (2750 to 5500 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).
- C. High-Pressure Spray: 800 to 1200 psi (5500 to 8250 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
- B. Qualification Data: For restoration specialists including field supervisors and chemical manufacturer.
- C. Cleaning Program: Describe cleaning process in detail, including materials, methods, and equipment to be used and protection of surrounding materials on building and Project site, and control of runoff during operations.
 - 1. If materials and methods other than those indicated are proposed for cleaning work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate their effectiveness for this Project.

1.4 QUALITY ASSURANCE

- A. Masonry Cleaning Specialist Qualifications: Engage an experienced masonry cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.
 - 1. Field Supervision: Masonry cleaning specialist firms shall maintain experienced full-time supervisors on Project site during times that masonry cleaning is in

progress. Supervisors shall not be changed during Project except for causes beyond the control of masonry cleaning specialist firm.

- 2. Masonry Cleaning Worker Qualifications: Persons who are experienced and specialize in masonry cleaning work of types they will be performing.
- B. Chemical Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.
- C. Mockups: Prepare mockups of masonry cleaning as follows to demonstrate aesthetic effects and qualities of materials and execution. Prepare mockups on existing walls and steps under same weather conditions to be expected during remainder of the Work.
 - 1. Locate mock-ups where directed by Architect.
 - 2. Clean an area approximately 25 sq. ft. (2.3 sq. m) in area for each type of masonry and surface condition requiring cleaning.
 - 3. Test cleaners and methods on samples of adjacent materials for possible adverse reactions unless cleaners and methods are known to have deleterious effect.
 - 4. Begin with application of low pressure water wash to mock-up areas and progress to job-mixed detergent and then to chemical cleaners only as required to obtain desired results.
 - a. Perform test cleaning panels in presence of Architect. If Architect rejects mock-up, proceed with additional test cleaning panels.
 - 5. Do not commence general masonry cleaning work until Architect's acceptance of mock-ups' visual qualities has been obtained.
 - 6. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.
 - 7. Cover and protect approved mock-ups until completion of all general masonry cleaning work.
 - 8. Approved mock-ups will be used as standard against which all masonry cleaning work will be judged.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

1.6 PROJECT CONDITIONS

- A. Clean masonry surfaces only when air temperature is 40 deg F (4 deg C) and above and is predicted to remain so for at least 7 days after completion of cleaning.
- B. Clean masonry before proceeding with repointing, brick and cast stone replacement work, and cast stone resetting work to ensure color match of mortar and replacement brick to original cleaned masonry units and mortar.

PART 2 - PRODUCTS

- 2.1 CLEANING MATERIALS
 - A. Water for Cleaning: Potable.
 - B. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate (TSPP), 1/2 cup (125 mL) of water soluable, non-ionic cleaner, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.
 - C. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate (TSPP), 5 quarts (5 L) of 5 percent sodium hypochlorite (bleach), and 15 quarts (15 L) of hot water for every 5 gal. (20 L) of solution required.
 - D. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.
 - 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. Dumond Chemicals, Inc.; Safe n' Easy Architectural Cleaner/Restorer.
 - b. Price Research, Ltd.; Price Non-Acid Masonry Cleaner.
 - c. ProSoCo; Enviro Klean Restoration Cleaner.
 - E. Mild Acidic Cleaner: Manufacturer's standard mildly acidic cleaner containing no hydrochloric, hydrofluoric, or sulfuric acid; or chlorine bleaches.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Diedrich Technologies Inc.; Envirorestore 100.
 - b. Dumond Chemicals, Inc.; Safe n' Easy Heavy Duty Restoration Cleaner
 - c. ProSoCo; Sure Klean Light-Duty Restoration Cleaner.
 - F. Acidic Cleaner: Manufacturer's standard acidic masonry restoration cleaner composed of hydrofluoric acid blended with other acids, detergents, wetting agents, and inhibitors.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. American Building Restoration Products, Inc.; 801 Heavy Duty Masonry Cleaner.
 - b. Diedrich Technologies Inc.; 101 Masonry Restorer or 101G Granite, Terra Cotta, and Brick Cleaner.
 - c. Hydrochemical Techniques, Inc.; Hydroclean Brick, Granite, Sandstone and Terra Cotta Cleaner (HT-626).
 - d. Price Research, Ltd.; Price Heavy Duty Restoration Cleaner or Price Restoration Cleaner.
 - e. ProSoCo; Sure Klean Heavy-Duty Restoration Cleaner, Sure Klean 1028 Restoration Cleaner or Sure Klean Restoration Cleaner.
 - G. One-Part Limestone and Cast Stone Cleaner: Manufacturer's standard one-part or nonacidic formulation for cleaning limestone that does not contain hydrofluoric acid.

- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. ProSoCo; Sure Klean Limestone Restorer.
 - b. Dumond Chemicals, Inc.; Safe n' Easy Limestone Cleaner
 - c. Chemique; C-13 Limestone Cleaner/Restorer
- H. Two-Part Limestone Cleaner: Manufacturer's standard system consisting of potassium or sodium hydroxide based, alkaline prewash cleaner and acidic afterwash cleaner that does not contain hydrofluoric acid.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. ProSoCo; Sure Klean 766 Limestone & Masonry Prewash and Afterwash
 - b. Diedrich Technologies Inc.; 707X Limestone Cleaner Pre-Rinse and 707N Limestone Neutralizer After-Rinse.
 - c. Price Research, Ltd.; Limestone Pre-Wash and Afterwash

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being cleaned, building site, plants, and surrounding buildings from harm resulting from masonry cleaning work.
 - 1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of masonry cleaning work.
- B. Comply with chemical cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
 - 1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
 - 2. Keep wall wet below area being cleaned to prevent streaking from runoff.
 - 3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
 - 4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
 - 5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
- 3.2 CLEANING MASONRY, GENERAL

- A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other.
- B. Select cleaning agents for their compatibility with masonry substrates being cleaned and materials to be removed from surfaces. Begin with most gentle cleaning materials and methods and progress to stronger materials and application techniques only as needed. Begin with non-acidic and alkaline cleaners before using acidic cleaners.
 - 1. Do not use acidic cleaners on cast stone surfaces unless its use is expressly permitted by chemical cleaner manufacturer.
- C. Use only those cleaning methods indicated for each masonry material and location.
 - 1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
 - 2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
 - a. Equip units with pressure gages.
 - 3. For chemical cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
 - 4. For water spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
- D. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.
- E. Removing Plant Growth: Completely remove plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.
- F. Water Application Methods:
 - 1. Water Soak Application: Soak masonry surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
 - 2. Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- G. Chemical Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical cleaner manufacturer's written instructions; use brush or spray application methods, at Contractor's option. Do not spray apply at pressures exceeding

50 psi (345 kPa). Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.

- H. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.
 - 1. Apply neutralizing agent and repeat rinse, if necessary, to produce tested pH of between 6.7 and 7.5.
- I. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.
- 3.3 CLEANING MASONRY
 - A. Cold-Water Wash: Use cold water applied by low-pressure spray.
 - B. Cold Water Soak:
 - 1. Apply cold water by intermittent soaking.
 - 2. Use perforated hoses or other means that will apply a fine water mist to entire surface being cleaned.
 - 3. Apply water in cycles with at least 30 minutes between cycles.
 - 4. Continue water application until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests.
 - 5. Remove soil and softened surface encrustation from masonry with cold water applied by low-pressure spray.
 - C. Detergent Cleaning:
 - 1. Wet masonry with cold water applied by low-pressure spray.
 - 2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
 - 3. Rinse with cold water applied by low-pressure spray to remove detergent solution and soil.
 - 4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.
 - D. Mold, Mildew, and Algae Removal:
 - 1. Wet masonry with cold water applied by low-pressure spray.
 - 2. Apply mold, mildew, and algae remover by brush.
 - 3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.

- 4. Rinse with cold water applied by low-pressure spray to remove mold, mildew, and algae remover and soil.
- 5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.
- E. Chemical Cleaning:
 - 1. Wet masonry with cold water applied by low-pressure spray.
 - 2. Apply cleaner to masonry by brush or low-pressure spray. Let cleaner remain on surface for period recommended by manufacturer.
 - 3. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
 - 4. Adjust dilution of solution, dwell time, and application procedures as required to produce cleaning effect established by mockup.

END OF SECTION 049100

SECTION 049110 - MASONRY REPOINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes repointing mortar joints in the following:
 - 1. Brick exterior wall surfaces.
 - 2. Cast stone exterior wall surfaces.
- 1.2 ACTION SUBMITTALS
 - A. Mortar Analysis: Provide a mortar analysis of existing original pointing mortar to be matched.
 - 1. Analysis shall be by an architectural conservation laboratory having 10 years of experience, including at least 5 historic preservation projects of similar size, scope and complexity, and shall be approved by the Architect.
 - 2. Analysis shall include, but not be limited to, color of mortar sample, composition of mortar, including ratio of sand to cement in percentage format as well as strength and hardness, and color, size and distribution of sand grains. Furnish color keyed to standard color system.
 - 3. Provide mortar analysis of pointing mortar with samples taken from the exact location as directed by Architect.
 - B. Mixes: Submit proposed mixes for each type of mortar and grout required, indicating materials and proportions to be used.
 - C. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
 - D. Samples for Verification: Before erecting mockup, submit samples of the following:
 - 1. Existing Mortar: Submit 0.3 cubic inch sample of original mortar and 0.3 cubic inch sample of original sand for each type and color of pointing mortar to be matched.
 - 2. Each type of sand proposed for use in pointing mortar.
 - a. For blended sands, provide samples of each component and blend.
 - b. Identify sources, both supplier and quarry, of each type of sand.
 - 3. Each type of pointing mortar proposed for use in the form of sample mortar strips, 6 inches (150 mm) long by 1/2 inch (13 mm) wide, set in aluminum or plastic channels. Provide samples for each mortar color required, showing the full color range expected in the finished construction

- a. Include with each sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.
- b. Make samples using the same sand and mortar ingredients to be used on Project. Label samples to indicate type and amount of colorant used.
- c. Reformulate and resubmit until match is approved by Architect.
- E. Qualification Data: For repointing specialists including field supervisors.
- F. Repointing Program: Provide detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of repointing work including protection of surrounding materials on building and Project site.
 - 1. Include methods for keeping pointing mortar damp during curing period.
 - 2. If materials and methods other than those indicated are proposed for any phase of repointing work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate their effectiveness for this Project.
 - 3. Program shall include provisions for supervising performance of workers and preventing damage due to worker fatigue.

1.3 QUALITY ASSURANCE

- A. Restoration Specialist Qualifications: Work must be performed by a firm having not less than five (5) years successful experience in comparable masonry repointing work including work on at least three (3) buildings listed in the National Register of Historic Places under the direction of federal and state preservation agencies in the last five years and employing personnel skilled in the installation processes and operations indicated.
 - 1. Only skilled journeymen masons who are thoroughly trained and experienced in removal and insertion of mortar in joints of historic masonry buildings, and completely familiar with the materials and methods required shall be used for the work.
 - 2. One skilled journeyman mason shall be present at all times during execution of the work and shall personally direct the work.
 - 3. In acceptance or rejection of masonry repointing work, no allowance will be made for lack of skill on the part of the workmen.
- B. Source Limitations: Obtain each type of material for masonry repointing work (cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties..
- C. Mockups: Before beginning masonry repointing work, prepare mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Final approval of exposed mortar color and texture, mortar tooling, and mortar removal techniques will be made based on acceptance of mock-up. Prepare mockups on existing walls under same weather conditions to be expected during remainder of the Work. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

- 1. Rake out joints in two separate areas approximately 36 inches (900 mm) high by 72 inches (1800 mm) wide for each type of repointing required and repoint one of the two areas.
- 2. Prepare mock-ups by demonstrating removal techniques on existing mortar joints and also insertion of pointing mortar in these joints.
- 3. Locate mock-ups in area of cleaned masonry where directed by Architect
- 4. Do not commence general repointing work until Architect's acceptance of mock-ups' visual qualities has been obtained. Reprepare panels as required to obtain such approval.
- 5. Cover and protect approved mock-ups until completion of all general masonry repointing work.
- 6. Approved mock-ups will be used as standard against which all masonry repointing work will be judged.
- 7. Approved mock-ups may become part of the final work upon acceptance by Architect.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
 - 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 hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
 - D. Store lime putty covered with water in sealed containers.
 - E. Store sand where grading and other required characteristics can be maintained and contamination avoided.
- 1.5 PROJECT CONDITIONS
 - A. Repoint mortar joints only when air temperature is between and 40 and 90 deg F (4 and 32 deg C) and is predicted to remain so for at least 7 days after completion of work.
 - B. Cold-Weather Requirements: Comply with the following procedures for mortar-joint pointing:
 - 1. When air temperature is below 40 deg F (4 deg C), heat mortar ingredients and existing masonry walls to produce temperatures between 40 and 120 deg F (4 and 49 deg C).
 - 2. When mean daily air temperature is below 40 deg F (4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 7 days after repair and pointing.

- C. Hot-Weather Requirements: Protect mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar materials. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above.
- D. Do not remove mortar from more than 25 square feet of contiguous wall area at any one time before repointing, as structural integrity of existing wall may be compromised.
- 1.6 SEQUENCING AND SCHEDULING
 - A. Do not proceed with preparation of mortar samples or mock-ups until masonry has been cleaned to ensure repointing mortar matches color and texture of original cleaned mortar.
 - B. Coordinate masonry pointing work with other masonry work of Division 04 to ensure proper completion of all masonry work.

PART 2 - PRODUCTS

- 2.1 MORTAR MATERIALS
 - A. Portland Cement: ASTM C 150, Type I or Type II.
 - 1. Provide white cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
 - B. Masonry Cement: Not permitted.
 - C. Hydrated Lime: ASTM C 207, Type S.
 - D. Quicklime: ASTM C 5, pulverized lime.
 - E. Factory-Prepared Lime Putty: Screened, fully-slaked lime putty, prepared from pulverized lime complying with ASTM C 5.
 - F. Mortar Sand: ASTM C 144, unless otherwise indicated.
 - 1. Color: Provide natural sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
 - 2. For pointing mortar, provide sand with rounded edges.
 - 3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands, if necessary, to achieve suitable match.
 - G. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.
 - H. Water: Potable.
- 2.2 MORTAR MIXES

- A. General: Provide mortar in color, texture and formulation to match existing pointing mortar for each different masonry material. Up to two mixes may be required.
- B. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.
- C. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
 - 1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
- D. Colored Mortar: Produce mortar of color to match existing by using selected ingredients. Do not alter specified proportions without Architect's approval.
 - 1. Use naturally colored aggregates to produce required mortar color to greatest extent possible, before adding pigments.
 - 2. Pigments: Where mortar pigments are used, do not exceed a pigment-to-cement ratio of 1:10 by weight.
- E. Do not use admixtures of any kind in mortar, unless otherwise indicated.
- F. Mortar Proportions: Mix mortar materials in the following proportions:
 - 1. Pointing Mortar: Match existing formulation for each different masonry material. Up to two mixes may be required.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being repointed, building site, plants, and surrounding buildings from harm resulting from masonry repointing work.
 - 1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of repointing work.
- B. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, and projections to protect from mortar droppings.
 - 2. Keep wall area wet below repointing work to discourage mortar from adhering.

- 3. Immediately remove mortar in contact with exposed masonry and other surfaces.
- 4. Clean mortar splatters from scaffolding at end of each day

3.2 REPOINTING MASONRY

- A. Rake out and repoint mortar joints to the following extent:
 - 1. Joints where mortar is missing or where they contain holes.
 - 2. Cracked joints where cracks can be penetrated at least 1/4 inch (6 mm) by a knife blade 0.027 inch (0.7 mm) thick.
 - 3. Cracked joints where cracks are 1/8 inch (3 mm) or more in width and of any depth.
 - 4. Joints where they sound hollow when tapped by metal object.
 - 5. Joints where they are worn back 1/4 inch (6 mm) or more from surface.
 - 6. Joints where they are deteriorated to point that mortar can be easily removed by hand.
 - 7. Joints, other than those indicated as sealant-filled joints, where they have been filled with substances other than mortar.
 - 8. Joints filled with sealant, to the extent and in the locations indicated on Drawings.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows:
 - 1. Remove mortar from joints to depth of 2 to 2-1/2 times the height of the joint, but not less than that required to expose sound, unweathered mortar.
 - 2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 - 3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
 - 4. Hand tools or professional pneumatic stone cutting tools specially designed for mortar removal and masonry restoration (manufactured by Trow & Holden Co., Barre, Vt. or equal) only shall be used for removal of mortar. Only chisels narrower than the joints shall be used.
 - 5. When permitted by Architect, and based on acceptance of mock-up techniques for repointing brickwork, saw cutting down the center of the bed joint in brickwork prior to hand tool use may be performed.
 - 6. No other power tools will be permitted during this procedure.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- E. Point joints as follows:
 - 1. Rinse masonry-joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen masonry-joint surfaces before pointing.
 - 2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch (9 mm)

until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

- 3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch (9 mm). Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.
- 4. When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.
- F. Cure mortar by maintaining in thoroughly damp condition for at least 72 hours including weekends and holidays.
 - 1. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
 - 2. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
- G. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.3 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners.
- B. Wash adjacent woodwork, glass and other nonmasonry surfaces. Use detergent and soft brushes or cloths.

END OF SECTION 049110

SECTION 050133 - MAINTENANCE OF STEEL LINTELS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes:
 - 1. Cleaning and mechanically removing loose paint and rust from existing steel lintels.
 - 2. Replacing damaged and deteriorated existing steel lintels.
- B. Related Sections Include the Following:
 - 1. Division 09 Section "Painting" for field finish painting lintels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
- B. Proposed replacement plan for damaged and deteriorated lintels, for Architect's approval.
- 1.3 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver materials to Project site packaged in protective waterproof wrappings and crating, labeled with contents.
 - B. Store materials on elevated platforms, under cover, and in a dry location.
- 1.4 PROJECT CONDITIONS
 - A. Field Measurements: Verify dimensions by field measurements before fabrication.
- 1.5 SEQUENCING AND SCHEDULING
 - A. Perform steel lintel maintenance work in the following sequence, unless otherwise indicated or approved:
 - 1. Clean and remove loose paint and rust from existing steel lintels.
 - 2. Replace damaged and deteriorated steel lintels as required.
 - 3. Apply cold galvanizing coating and prime paint steel lintels.

PART 2 - PRODUCTS

2.1 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- 2.2 MISCELLANEOUS MATERIALS
 - A. Primer: Epoxy mastic primer; Pittguard 95-245 Series by PPG or equal.
 - B. Cold Galvanizing Compound: ZRC Cold Galvanizing Compound by ZRC Worldwide, or equal.
- 2.3 LOOSE STEEL LINTELS (REPLACEMENT LINTELS)
 - A. Fabricate loose structural-steel lintels from steel angles and shapes in size to match existing at openings in masonry walls at locations indicated.
 - B. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches, unless otherwise indicated.
 - C. Hot-dip galvanize loose steel lintels located in exterior walls to comply with ASTM A 123.
 - D. Shop prime and field paint all lintels, leave embedded portions of lintels unpainted.

PART 3 - EXECUTION

- 3.1 CLEANING EXISTING LINTELS
 - A. Carefully remove existing loose paint and rust using mechanical methods.
 - B. Wipe with clean cloth
- 3.2 UNIT REPAIR AND REPLACEMENT
 - A. After existing steel lintels have been thoroughly cleaned, prepare a proposal for the replacement of damaged and deteriorated lintel for the approval of the Architect; coordinate with information included on drawings. Do not proceed with work until Architect's approval has been obtained.
 - B. Replace existing steel lintels that are damaged and deteriorated so as to affect their structural integrity.
 - C. Clean all surfaces of existing steel lintels and prepare for painting. Prime paint and/or cold galvanize metal immediately after cleaning and inspecting.
 - 1. Apply cold galvanizing compound to areas of metal that do not have existing paint on them.
 - 2. Shop prime all ferrous metal surfaces having cold galvanizing coat or previously painted coat.
 - 3. Topcoat immediately after prime coat has dried; coordinate with Section 099100 for

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specifications.

END OF SECTION 050133

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Field-installed shear connectors.
 - 3. Grout.
- B. Related Requirements:
 - 1. Section 053100 "Steel Decking" for field installation of shear connectors through deck.
 - 2. Section 055000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame miscellaneous steel fabrications and other steel items not defined as structural steel.
 - 3. Section 099113 "Exterior Painting" and Section 099123 "Interior Painting" for surface-preparation and priming requirements.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of 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.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
- 1.5 ACTION SUBMITTALS
 - A. Product Data: For each type of product.

- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment Drawings.
 - 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.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs).
- D. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- C. Mill test reports for structural steel, including chemical and physical properties.
- D. Product Test Reports: For the following:
 - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 2. Direct-tension indicators.
 - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 - 4. Shear stud connectors.
 - 5. Shop primers.
 - 6. Nonshrink grout.
- E. Field quality-control and special inspection reports.

1.7 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, or is accredited by the IAS Fabricator Inspection Program for Structural Steel (AC 172).
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category ACSE.

- C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1 or to SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- E. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 341 and AISC 341s1.
 - 3. AISC 360.
 - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.8 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive

engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.

- B. Moment Connections: Type FR, fully restrained.
- 2.2 STRUCTURAL-STEEL MATERIALS
 - A. All Shapes: As indicated on drawings.
- 2.3 BOLTS, CONNECTORS, AND ANCHORS
 - A. All bolts and anchors: As indicated on drawings.

2.4 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.5 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.
 - 1. Fabricate beams with rolling camber up.
 - 2. Mark and match-mark materials for field assembly.
 - 3. 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, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.
- 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 as indicated on drawing notes.
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces.
 - 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.

2.7 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, use Slip Critical bolts at bolted moment connections.
- 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. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.8 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces.
 - 6. Surfaces enclosed in interior construction.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards indicated on drawing notes.

- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). 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.

2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
 - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 - 2. Galvanize lintels shelf angles and all other steel exposed to weather.

2.10 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1. Liquid Penetrant Inspection: ASTM E 165.
 - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3. Ultrasonic Inspection: ASTM E 164.
 - 4. Radiographic Inspection: ASTM E 94.
- D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified 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 existing conditions. Include 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.

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-in-place 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. Baseplates Bearing Plates 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. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

- D. 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 are 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.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

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, provide Slip critical bolts at bolted moment connections.
- 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. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 - Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Verify structural-steel materials and inspect steel frame joint details.
 - 2. Verify weld materials and inspect welds.
 - 3. Verify connection materials and inspect high-strength bolted connections.

- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- D. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

END OF SECTION 051200

SECTION 053100 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Composite floor deck.
 - B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.
 - 2. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.
 - 3. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
 - 4. Section 099113 "Exterior Painting" for repair painting of primed deck and finish painting of deck.
 - 5. Section 099123 "Interior Painting" for repair painting of primed deck and finish painting of deck.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
 - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Welding certificates.
 - B. Product Certificates: For each type of steel deck.

- C. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 - 1. Power-actuated mechanical fasteners.
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.2 COMPOSITE FLOOR DECK

- A. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Canam Steel Corporation; Canam Group, Inc.
 - 2. <u>Nucor Corp</u>.
- B. 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-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), zinc coating.
- 2. Profile Depth: As indicated.
- 3. Design Uncoated-Steel Thickness: As indicated.
- 4. Span Condition: As indicated.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbonsteel screws, No. 10 (4.8-mm) minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- H. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, with 3-inch- (76-mm-) wide flanges and sloped recessed pans of 1-1/2-inch (38-mm) minimum depth. For drains, cut holes in the field.
- I. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight.

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 of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- 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. Do not stretch or contract side-lap interlocks.
 - 1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

- A. 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 (38 mm) long, and as follows:
 - 1. Weld Diameter: As indicated.
 - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated on drawing notes.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

- 1. End Joints: Lapped 2 inches (51 mm) minimum or butted at Contractor's option.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches (305 mm) apart with at least one fastener at each corner.
 - 1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- C. Prepare test and inspection reports.

3.5 PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 053100

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SECTION 054000 – COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior load bearing steel stud framing at learning stair.
 - 2. Interior load bearing steel floor joist framing at learning stair.
- B. Related Sections include the following:
 - 1. Division 05 Section "Metal Fabrications" for miscellaneous steel framing.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated in structural notes on the Drawings.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Load Bearing Studs: Horizontal deflection of 1/120 of the horizontally projected span.
 - b. Floor Joists: L/360 for live load and L/240 for total load
 - 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 (67 deg C).
- B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
- C. Cold-Formed Steel Framing Design Standards:
 - 1. Wall Studs: AISI S211.
 - 2. Headers: AISI S212.
 - 3. Lateral Design: AISI S213.
- D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
- 1.3 SUBMITTALS
 - A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
 - 1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the professional engineer licensed in the State of New York, who is responsible for their preparation.
- C. Welding certificates.
- D. Qualification Data: For professional engineer.
- E. 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:
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.
- F. Research/Evaluation Reports: For cold-formed metal framing.
- 1.4 QUALITY ASSURANCE
 - A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
 - B. Professional Engineer Qualifications: A professional engineer who is licensed in the State of New York and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
 - C. Product Tests: Mill certificates or data from a qualified independent testing agency 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. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

- F. 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 Truss Design."
- G. Preinstallation Conference: Conduct conference at Project site.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
 - B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:
 - 1. ClarkDietrich Building Systems.
 - 2. MarinoWare; a division of Ware Industries.
 - 3. Super Stud Building Products, Inc.
- 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: ST33H (ST230H) and ST50H (ST340H) as required by structural performance.
 - 2. Coating: G60 (Z180).
- 2.3 INTERIOR LOAD BEARING WALL FRAMING
 - A. Built-up Members: Built-up members of manufacturer's standard C-shaped steel section, with stiffened flanges, nested into a U-shaped steel section joist track, with unstiffened flanges; unpunched; of web depths indicated; and as follows:
 - 1. Minimum Base-Metal Thickness: 16 gauge minimum, unless otherwise indicated Drawings.
 - 2. Flange Width: 1-5/8 inches (41 mm), minimum.
- 2.4 FLOOR JOIST FRAMING

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- A. Steel Floor Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm) minimum, unless otherwise indicated Drawings.
 - 2. Flange Width: 1-5/8 inches (41 mm), minimum

2.5 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. Gusset plates.
 - 7. Hole reinforcing plates.
 - 8. Backer plates.

2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts headless, hooked bolts headless bolts, with encased end threaded, and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C mechanically deposition according to ASTM B 695, Class 50.
- 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.
- 2.7 MISCELLANEOUS MATERIALS
 - A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035
 - B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
 - C. Nonmetallic, Nonshrink Grout: 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.
 - D. Shims: Load bearing, high-density multimonomer plastic, nonleaching.
 - E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.8 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's 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.
- 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 (1:960) and as follows:

- 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) 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 (3 mm).

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.

3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.
- C. 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.

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" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. 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.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. 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.
- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- 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 (1:960) and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 INTERIOR LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated.
- C. Space studs as indicated on Shop Drawings.
- D. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- E. Isolate non-load-bearing steel framing from building structure as required on Drawings to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single-leg deflection tracks and anchor to building structure.
 - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to studs and anchor to building structure.

- 4. Connect drift clips to cold formed metal framing and anchor to building structure.
- F. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 - 1. Install additional row of horizontal bridging in curtain wall stud beneath deflection track when curtain wall studs are not fastened to an additional top track.
 - 2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.
- 3.5 INSTALLATION OF JOIST FRAMING
 - 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 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.
 - C. Install bridging at intervals indicated on Shop Drawings.
 - D. 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.
- 3.6 FIELD QUALITY CONTROL
 - A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - B. Field and shop welds and screw connections will be subject to testing and inspecting.
 - C. Testing agency will report test results within 24 hours 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.
 - F. Inspect all prefabricated trusses before installation.
- 3.7 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 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Steel stairs with concrete-filled treads.
 - 2. Handrails and railings at stairs.
 - 3. Handrails attached to walls adjacent to stairs.
 - 4. Guardrails at roof.
 - 5. Loose bearing and leveling plates.
 - 6. Loose steel lintels.
 - 7. Steel framing and supports for ceiling hung equipment, and other items indicated on Drawings.
 - 8. Steel framing and supports for mechanical and electrical equipment.
 - 9. Steel framing and supports for part height partitions.
 - 10. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 11. Steel perforated radiator covers.
 - 12. Metal performance trusses
 - 13. Aluminum stair treads at exterior.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal stairs, handrails and railings, and guardrails.
- B. Structural Performance of Metal Stairs, Walkways and Platforms: Provide metal stairs, walkways and platforms capable of withstanding the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each component of metal stairs, walkways and platforms.
 - 1. Treads and Platforms of Metal Stairs, and Walkways: Capable of withstanding a uniform load of 100 lbf/sq. ft. (4.79 kN/sq. m) or a concentrated load of 300 lbf (1.33 kN) on an area of 4 sq. in. (25.8 sq. cm), whichever produces the greater stress.
 - 2. Stair and Walkway Framing: Capable of withstanding stresses resulting from loads specified above in addition to stresses resulting from railing system loads.
 - 3. Limit deflection of treads, platforms, walkways and framing members to L/360 or 1/4 inch (6.4 mm), whichever is less.
- C. Structural Performance of Handrails and Railings: Provide handrails and railings capable of withstanding the following structural loads without exceeding the allowable design working stress of materials for handrails, railings, anchors, and connections:

- 1. Top Rail of Guards: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf/ft. (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf/ft. (1460 N/m) applied vertically downward.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
- 2. Handrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf/ft. (730 N/m) applied in any direction.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
- 3. Infill Area of Guards: Capable of withstanding a horizontal concentrated load of 200 lbf (890 N) applied to 1 sq. ft. (0.09 sq. m) at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area.
 - a. Load above need not be assumed to act concurrently with loads on top rails in determining stress on guards.

1.3 ACTION SUBMITTALS

- A. Product Data: For all fabricated products including the following:
 - 1. Paint products.
 - 2. Grout.
 - 3. Performance trusses.
 - 4. Treads
 - 5. Radiator covers
- B. Shop Drawings: Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Verification: Sample of the following:
 - 1. 6" square piece of perforated steel plate used for radiator covers, with final painted finish.
 - 2. 6" long fabricated stainless steel handrail
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Welding Certificates: Copies of certificates for welding procedures and personnel.

- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Delegated-Design Submittal: For stairs, handrails and railings, and guardrails, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing metal fabrications 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.
- B. 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 metal stairs, platforms, walkways, and handrails and railing systems that are similar to those indicated for this Project in material, design, and extent.
- C. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."
 - 2. AWS D1.3, "Structural Welding Code--Sheet Steel."
 - 3. AWS D1.2, "Structural Welding Code--Aluminum."
 - 4. AWS D1.6, "Structural Welding Code--Stainless Steel."
 - 5. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.7 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. 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.

- 1.8 SEQUENCING AND SCHEDULING
 - A. Sequence and coordinate installation of wall handrails as follows:
 - 1. Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.
 - 2. Mount handrails only on gypsum board assemblies reinforced to receive anchors, and where the location of concealed anchor plates has been clearly marked for benefit of Installer.

PART 2 - PRODUCTS

- 2.1 METALS, GENERAL
 - A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- 2.2 FERROUS METALS
 - A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - B. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500. For exterior installations and where indicated, provide tubing with hot-dip galvanized coating.
 - C. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads. For exterior installations and where indicated, provide pipe with hot-dip galvanized coating.
 - D. Slotted Channel Framing: Cold-formed metal channels with flange edges returned toward web and with 9/16-inch- (14.3-mm-) wide slotted holes in webs at 2 inches (51 mm) o.c.
 - 1. Width of Channels: 1-5/8 inches (41 mm).
 - 2. Depth of Channels: As indicated.
 - 3. Metal and Thickness: Galvanized steel complying with ASTM A 653/A 653M, structural quality, Grade 33 (Grade 230), with G90 (Z275) coating; 0.108-inch (2.8-mm) nominal thickness.
 - 4. Finish: Unfinished.
 - E. Malleable-Iron Castings: ASTM A 47, Grade 32510 (ASTM A 47M, Grade 22010).
 - F. Gray-Iron Castings: ASTM A 48, Class 30 (ASTM A 48M, Class 200), unless another class is indicated or required by structural loads.

- G. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 (ASTM A 47M) malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.
- H. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- I. Perforated Steel Radiator Covers: Provide custom perforated plate steel radiator covers based on pattern "234 Pebbles" by Architectural Grille to provide a minimum of 50% open area. Panels shall have a 12" x 12" access door, shall be predrilled to accommodate required screw fastening pattern, and shall be powder painted after fabrication in color as selected by Architect. Provide strippable protective film after factory finishing. Size shall be as indicated on HVAC drawings. Provide all required trim pieces and fasteners in color to match panels.
- 2.3 STAINLESS STEEL
 - A. Tubing: ASTM A 554, Grade MT 304
 - B. Pipe: ASTM A 312/A 312M, Grade TP 304
 - C. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.
 - D. Plate and Sheet: ASTM A 666, Type 304
- 2.4 ALUMINUM
 - A. Extruded Bars, Shapes and Mouldings: ASTM B 221 (ASTM B 221M), alloy 6063-T6 or 6063-T52.
 - B. Castings: ASTM B 26, Almag 35.
- 2.5 PAINT
 - A. Shop Primer for Interior Ferrous Metal: Modified oil-alkyd primer, Tnemec 88-559 or 10-1009, or equivalent. Primer shall be compatible with finish paint specified in Section 09900.
 - B. Shop Primer for Galvanized Ferrous Metal: Polyamide epoxy primer, Tnemec F.C. Typoxy Series 27, or equivalent. Primer shall be compatible with finish paint specified in Section 09900.
 - C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

- D. Shop Primer for Exterior Ferrous Metal: Organic zinc-rich primer, complying with SSPC-Paint 20 and compatible with topcoat; Tneme-Zinc 90-97; Tnemec Company, Inc.
- E. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

2.6 FASTENERS

- A. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls, except as noted below. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36.
- D. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Wood Screws: Flat head, carbon steel, ASME B18.6.1.
- G. Plain Washers: Round, carbon steel, ASME B18.22.1 (ASME B18.22M).
- H. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1 (ASME B18.21.2M).
- I. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Material: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
- J. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as needed.
- 2.7 GROUT
 - A. 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.
- 2.8 CONCRETE FILL

A. Concrete Materials and Properties: Normal-weight, ready-mixed concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), unless higher strengths are indicated.

2.9 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items 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. Shear and punch metals cleanly and accurately. Remove burrs.
- C. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. 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 and contour of welded surface matches that of adjacent surface.
- E. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- F. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- G. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.
- H. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- I. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

- J. Remove sharp or rough areas on exposed traffic surfaces.
- K. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

2.10 ROUGH HARDWARE

- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 sections.
- B. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.11 METAL STAIRS

- A. General: Construct stairs to conform to sizes and arrangements indicated. Join pieces together by welding, unless otherwise indicated. Provide complete stair and bleacher assemblies, including metal framing, hangers, struts, clips, brackets, bearing plates, and other components necessary for the support of stairs, and platforms, and as required to anchor, hang, and contain the stairs on the supporting structure.
- B. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.
 - 1. Commercial class.
- C. Stair Framing: Fabricate stringers of structural steel channels, or plates, or a combination thereof, as indicated. Provide closures for exposed ends of stringers. Construct platforms of structural steel channel headers and miscellaneous framing members as indicated. Weld headers to strings, and framing members to strings and headers.
 - 1. Where required, provide hanger rods to support landings from floor construction above. Locate hanger rods within stud space of shaft-wall construction.
 - 2. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- D. Metal Risers, Subtread Pans, and Subplatforms: Form to configurations shown from steel sheet of thickness necessary to support indicated loads, but not less than 0.0677 inch (1.7 mm).
 - 1. Steel Sheet: Uncoated cold-rolled steel sheet, unless otherwise indicated.
 - 2. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.

- 3. Shape metal pans to include nosing integral with riser.
- E. Steel Stair Finishes:
 - 1. Provide hot-dipped galvanized finish for all components of exterior stair and platform system including fittings, brackets, anchors, fasteners, and sleeves
 - 2. Shop prime and field paint all steel stairs systems
- 2.12 HANDRAILS AND RAILINGS AND GUARDRAILS
 - A. General: Fabricate handrails and railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
 - B. Interconnect members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - 1. At tee and cross intersections of pipe and tube, cope ends of intersecting members to fit contour of tube to which end is joined, and weld all around.
 - C. Form changes in direction of handrails and rails as detailed.
 - D. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
 - E. Close exposed ends of pipe and tube handrail and railing members with prefabricated end fittings.
 - F. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.
 - G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting railings and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
 - 1. Connect railing posts to metal framing by direct welding, unless otherwise indicated.
 - 2. Connect railing posts to concrete by inserting into preset sleeves, attaching to floor brackets, or core drilling, as indicated.
 - H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

- I. 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.
- J. For railing posts set in concrete, provide steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with steel plate forming bottom closure.
- K. For galvanized handrails and railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
- L. For nongalvanized handrails and railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
- M. Steel Handrail Finishes:
 - 1. Provide non-galvanized finish for steel components of interior steel railings and handrails. Provide nongalvanized ferrous metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in masonry and concrete construction.
 - 2. Provide hot-dipped galvanized finish for all components of exterior steel handrail and railing system including fittings, brackets, anchors, fasteners, and sleeves.
 - 3. Shop prime and field paint all steel handrails and railings.
- N. Stainless Steel Handrail Finishes: No. 4.
- 2.13 LOOSE BEARING AND LEVELING PLATES
 - A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
 - B. Galvanize plates after fabrication.
- 2.14 LOOSE STEEL LINTELS
 - A. Fabricate loose structural-steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
 - B. Weld adjoining members together to form a single unit where indicated.
 - C. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches (200 mm), unless otherwise indicated.
 - D. Galvanize loose steel lintels located in exterior walls.
 - E. Shop prime and field paint all lintels, leave embedded portions of lintels unpainted.
- 2.15 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports that are not a part of structural-steel framework as necessary to complete the Work.
- B. Fabricate units from structural-steel shapes, plates, tubes, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors 1-1/4 inches (32 mm) wide by 1/4 inch (6 mm) thick by 8 inches (200 mm) long at 24 inches (600 mm) o.c., unless otherwise indicated.
 - 3. Furnish inserts if units must be installed after concrete is placed.
- C. Fabricate supports for ceiling hung performance trusses from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as indicated. Drill or punch bottom flanges of beams to receive hanger rods; locate holes where indicated on Shop Drawings.
- D. Galvanize miscellaneous framing and supports where indicated, and in exterior locations.

2.16 SAFETY TREADS

- A. Fabricate units of extruded aluminum in sizes and configurations indicated and in lengths necessary to accurately fit existing stair treads and conditions. Provide units with an integral abrasive finish consisting of aluminum oxide, silicon carbide, or a combination of both.
- B. Configurations: Provide units in the following configurations, unless otherwise indicated:
 - Safety Renovation Treads: Nosings: Extruded aluminum base with abrasive filler; two-toned with contrasting color strip at nosing; 11" wide, 9/32" thick, nose 1-1/8" underside, beveled back, beveled ends, and countersunk holes for fasteners, designed for surface application over existing concrete steps. Colors shall be as selected by Architect.
- C. Provide anchoring cement and mechanical fasteners for installation over existing treads.
- D. Provide leveling compound for leveling out existing surfaces.
- E. Apply bituminous paint to concealed bottoms, sides, and edges of units set on concrete.
- F. Basis of Design Product: Provide Stairmaster® type 511 safety renovation treads as manufactured by Wooster Products Inc. or equal products by one of the following:
 - 1. American Safety Tread Co., Inc.
 - 2. Amstep Products.

- 3. Safe-T-Metal Co.
- 2.17 METAL PERFORMANCE TRUSSES
 - A. Provide structural, modular aluminum truss systems fabricated from 50mm x 3mm aluminum tube, and 25mm x 3mm bracing. Provide 15.74" outside diameter cross section truss in the following configurations:
 - 1. Box truss, 9.84 ft (3m) long for each section; overall truss length required as indicated on Drawings
 - 2. Basis of Design Product: Provide DT44P Square Truss, Model DT-4166P by Global Truss, available from Starlight Entertainment, or equal.
 - B. Accessories: Provide all accessories and fittings as required for complete installation including the following:
 - 1. Connection system/coupler components
 - 2. Threaded rod with bracket as indicated on Drawings.
 - a. Brackets shall be Mega Truss Pick for Threaded Rod Installations, size as required, by The Light Source, or equal.
 - 3. Television Mount: Global Truss Model DT-TV-MT34, 29.25 inches long aluminum mounting bar, or equal. Provide two mounting bars per screen and turn bar to run vertically with a clamp on the end of the mounting bar.
 - 4. Other accessories as required
 - C. Finish: Clear anodized aluminum.
- 2.18 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.
- 2.19 STEEL AND IRON FINISHES
 - A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
 - 1. ASTM A 123, for galvanizing steel and iron products.
 - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware..
 - B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:
 - 1. Exteriors (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

- C. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes indicated as unpainted, and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Paint embedded steel that is partially exposed on exposed portions and initial 2 inches of embedded areas only.
 - 1. Do not paint surfaces to be welded or high-strength bolted with friction-type connections.
 - 2. Apply 2 coats of paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
- D. Powder-Coat Finish: Provide Weather Resistant TGIC Polyester Powder Coating "TIGER Drylac" Series 49 or equal. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color(s): As scheduled or if not scheduled, as selected by Architect from manufacturer's full range.
- 2.20 ALUMINUM FINISHES
 - A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 - B. As-Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).
 - C. Clear Anodized Finish: AAMA 611; AA-M12C22A31.
 - D. Powder Paint: Manufacturer's standard process.
 - 1. Color(s): As selected by Architect from manufacturer's full range.
- 2.21 STAINLESS-STEEL FINISHES
 - A. Remove tool and die marks and stretch lines or blend into finish.
 - B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
 - C. Directional Satin Finish: No. 4.
 - D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.
- 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. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- E. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 INSTALLING METAL STAIRS WITH GROUTED BASEPLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of baseplates.
- B. Set steel stair baseplates on wedges, shims, or leveling nuts. After stairs have been positioned and aligned, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
 - 1. Use nonmetallic, nonshrink grout, unless otherwise indicated.
 - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 INSTALLING RAILINGS AND HANDRAILS

- A. Adjust handrails and railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and railing ends to building construction as follows:
 - 1. Anchor posts to steel by welding directly to steel supporting members.
 - 2. Use steel pipe sleeves preset and anchored into concrete for installing posts where indicated. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8-inch (3-mm) buildup, sloped away from post.
 - 3. Where indicated, core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions
 - 4. Cover anchorage joint of post with flange of same metal as post where indicated.
 - 5. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
 - 6. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends.
- B. Attach handrails to wall with wall brackets. Provide bracket with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as follows:
 - 1. Use type of bracket with predrilled hole for exposed bolt anchorage.
 - 2. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 3. For hollow masonry anchorage, use toggle bolts.
 - 4. For steel-framed gypsum board assemblies, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members

3.4 SETTING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

- 1. Use nonshrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations, unless otherwise indicated.
- 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 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, if any.
- B. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 - 1. Where grout space under bearing plates is indicated at girders supported on concrete or masonry, install as specified above for setting and grouting bearing and leveling plates.

3.6 INSTALLING TREADS

- A. Install over existing stairs to comply with manufacturer's written instructions.
- B. Apply leveling compound over existing stairs to provide a level bearing surface for the safety stair treads.
- C. Secure treads to existing construction using adhesive and mechanical fasteners.
- 3.7 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 9 Section "Painting."
 - B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

SECTION 055313 - DECORATIVE METAL RAILINGS

- PART 1 GENERAL
- 1.1 SUMMARY
 - A. This Section includes the following:
 - 1. Guardrail railing system including the following:
 - a. Stainless steel posts and top rails.
 - b. Laminated glass balustrade panels.
 - c. Fascia-mount brackets.
 - d. Glass fitting sets.
 - 2. Stainless steel handrails and railings.
 - B. Related Sections include the following:
 - 1. Division 08 Section "Glazing" for glazing and glazing accessories.
- 1.2 DEFINITIONS
 - A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas, pedestrian guidance and support, visual separation, or wall protection.
- 1.3 PERFORMANCE REQUIREMENTS
 - A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
 - 1. Stainless Steel: 60 percent of minimum yield strength
 - Glass: 25 percent of mean modulus of rupture (50 percent probability of breakage), as listed in "Mechanical Properties" in AAMA's Aluminum Curtain Wall Series No. 12, "Structural Properties of Glass."
 - B. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails:
 - a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
 - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Top Rails of Guards:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf/ft. (730 N/m) applied in any direction.
 - c. Concentrated and uniform loads need not be assumed to act concurrently..

- 3. Infill of Guards:
 - a. Concentrated load of 50 lbf/ft. (730 N/m) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
 - b. Infill load and other loads need not be assumed to act concurrently.
- 4. Glass-Supported Railings: Support each section of top rail by a minimum of three glass panels or by other means so top rail will remain in place if any one panel fails.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of railings assembled from standard components.
 - 2. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 2. Indicate locations where holes will be provided in glass for handrail and baluster bracket anchorage.
 - 3. Indicate locations for wall-mounted handrail brackets.
- C. Samples for Verification: For each type of exposed finish required.
 - 1. Sections of each distinctly different linear railing member, including handrails and posts.
 - 2. Each type of glass required.
 - 3. Each type of fittings and brackets.
 - 4. Welded connections.

1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Qualification Data: For professional engineer and installer.
- C. Engineering Calculations: Prior to the preparation of shop drawings, prepare and submit structural analysis data for installed glazed decorative metal railing system indicating compliance with loading requirements stated. Calculations shall be signed and sealed by the professional engineer responsible for their preparation.
- 1.6 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in location of the project and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of handrails and railing systems that are similar to those indicated for this Project in material, design, and extent.
- B. Installer Qualifications: Installers trained by manufacturer and approved by manufacturer to install their railing systems.
- C. Source Limitations: Obtain all components of pre-engineered railing system, including glass, railings, brackets and fittings through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of railings and are based on the specific system indicated.
 - 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.
- E. 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 mockup consisting of one typical glass baluster panel with top rail and two posts, and all anchorage system components, attached to stair or balcony stringer.
 - 2. Locate where directed by Architect.
 - 3. Approved mock-ups may be incorporated in finished work.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls, stairs and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating railings system components without field measurements. Coordinate wall, stair and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
 - 2. Provide allowance for trimming and fitting of railings at site.

1.8 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings in walls. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, shoe moldings, and anchor bolts. Deliver such items to Project site in time for installation.

B. Coordinate locations of handrail brackets for glass-mounted handrails and any other fastenings, support brackets or other components mounted to or penetrating glass with glass tempering facility to ensure holes are drilled prior to tempering.

1.9 WARRANTY

- A. Warranty shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- B. Provide a manufacturer's warranty covering the material and workmanship for a period of one year for glass and five years for all other components from the date of final acceptance.
- C. Repair or replace any part which becomes defective or breaks during the warranty period.

PART 2 - PRODUCTS

- 2.1 PRODUCTS, GENERAL
 - A. Railing System: Provide all components required for complete installation, obtained from one system of single manufacturer.
- 2.2 MANUFACTURERS
 - A. Basis of Design Manufacturers: Provide specified railing system components manufactured by Viva Railings or equal by one of the following:
 - 1. Accent Architectural
 - 2. CR Laurence
 - 3. P&P ARTEC Inc.
 - 4. Livers Bronze Co.
 - 5. Blumcraft of Pittsburgh; division of CR Laurence
- 2.3 METALS, GENERAL
 - A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- 2.4 STEEL AND IRON
 - A. Bars: Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.
 - B. Plates, Shapes, and Bars: ASTM A 36/A 36M
- 2.5 STAINLESS STEEL

- A. Tubing: ASTM A 554, Grade MT 304.
- B. Pipe: ASTM A 312/A 312M, Grade TP 304.
- C. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.
- D. Plate and Sheet: ASTM A 666, Type 304
- 2.6 GLASS AND GLAZING MATERIALS
 - A. General: Refer to Section 088000 for additional requirements relating to glass and glazing materials.
 - B. Provide safety glass permanently marked with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
 - C. Laminated Glass: ASTM C 1172 laminated glass fabricated from two lites of clear lowiron, heat strengthened glass with .030 thick PVB interlayer in accordance with Section 088000. Provide products that comply with 16 CFR 1201 for Category II materials.
 - 1. Thickness for Glass Panels: 1/2" thick.
 - 2. Edges: Polished.
 - 3. PVB Interlayer: Frosted pattern, as selected by Architect.
- 2.7 GLAZED DECORATIVE METAL RAILING SYSTEM
 - A. Basis of Design Railing System: Blade Railing System manufactured by Viva Railings, or equal, with the following components:
 - 1. Top Rail and Handrail: Stainless steel tube, 2" diameter, with satin finish.
 - 2. Fixed Glass Fittings: Spider type, system standard.
 - 3. Posts: 2" double flat bar fabricated from stainless steel with satin finish. Space maximum 5'-0" o.c.
 - 4. Fascia Mounting Brackets: welded type, system standard for mounting conditions indicated on Drawings.
 - B. Glass Balusters: ¹/₂" thick clear low-iron laminated heat strengthened glass, with frosted interlayer as selected by Architect.
 - C. Accessories for Glass Railing/Guard Panels: Provide all other related accessories recommended or supplied by railing system manufacturer for installing of their products.
- 2.8 STAINLESS STEEL HANDRAIL AND RAILING SYSTEM
 - A. Basis of Design Components: As scheduled, manufactured by Viva Railings, or equal.
 - B. Handrails, Railings and Posts: Stainless steel tube, 2" diameter, with satin finish.

C. Accessories: Provide end caps, connector sleeves, preformed elbows, and other components as required for complete system installation.

2.9 FASTENERS

- A. General: Provide Type 304 stainless-steel fasteners.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work, unless otherwise indicated.

2.10 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior applications.

2.11 FABRICATION

- A. General: Fabricate glass panels and railings with support brackets to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm), 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. Welded Connections:
 - 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.

- G. Mechanical Connections: Connect railing members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- H. Form changes in direction as per manufacturer's directions for system indicated.
- I. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- J. Close exposed ends of hollow railing members with prefabricated end fittings.
- K. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.
- L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- 2.12 GLAZING PANEL FABRICATION
 - A. General: Fabricate to sizes and shapes required.
 - B. Refer to Section 088000 for additional requirements for fabricating glass.
- 2.13 FINISHES, GENERAL
 - A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
 - C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- 2.14 STAINLESS-STEEL FINISHES
 - A. Remove tool and die marks and stretch lines or blend into finish.
 - B. Grind and polish surfaces to produce uniform finish indicated, free of cross scratches.

- 1. Run grain of directionally textured finishes with long dimension of each piece.
- C. Satin Finish: #6
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

- 3.1 INSTALLATION, GENERAL
 - A. Fit exposed connections together to form tight, hairline joints.
 - B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. 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 (5 mm in 3 m).
 - C. Corrosion Protection: Coat concealed surfaces of aluminum and copper alloys that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
 - D. Adjust glass panels and 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.

3.2 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.
- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches (150 mm) of post.
- 3.3 INSTALLING GLASS PANELS

- A. Adjust glass panels before anchoring to ensure matching alignment at adjacent joints.
- B. Fastening to In-Place Construction: Use anchorage devices and fasteners necessary for securing glass panels and for properly transferring loads to in-place construction
- C. Install entire assembly to comply with approved shop drawings and manufacturer's written instructions.
- D. Do not cut, drill, or alter glass panels in field. Protect edges from damage.
- 3.4 ATTACHING GLASS GUARDRAIL SYSTEM TO FASCIA
 - A. Attach posts to fascia with fittings and brackets as per manufacturer's recommendations.
 - B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- 3.5 INSTALLING STAINLESS STEEL RAILINGS TO FLOOR
 - A. Core-drill holes not less than 6 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- 3.6 CLEANING
 - A. Clean metals by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.
 - B. Clean and polish glass.
- 3.7 PROTECTION
 - A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
 - B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field to shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055313

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Wood blocking, cants, furring, supports, and nailers.
 - 2. Plywood backing panels.
 - 3. Plywood subfloor.

1.2 DEFINITIONS

- A. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NELMA Northeastern Lumber Manufacturers Association.
 - 2. NLGA National Lumber Grades Authority.
 - 3. SPIB Southern Pine Inspection Bureau.
 - 4. WCLIB West Coast Lumber Inspection Bureau.
 - 5. WWPA Western Wood Products Association.

1.3 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.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D 5516 and ASTM D 5664.
 - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses.

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- B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
 - 1. Preservative-treated wood.
 - 2. Fire-retardant-treated wood.

1.5 QUALITY ASSURANCE

- A. All composite wood, engineered wood, or agrifber products (e.g., plywood, particleboard, medium density fiberboard) shall contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI).
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings..

PART 2 - PRODUCTS

- 2.1 WOOD PRODUCTS, GENERAL
 - A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Provide dressed lumber, S4S, unless otherwise indicated.
 - 3. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, and 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. Do not use inorganic boron (SBX) for sill plates.
 - 2. The use of CCA preservative treated wood is prohibited.
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
- C. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- 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. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, 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. Use treatment that does not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. 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 D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

2.4 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Furring.
 - 4. Sleepers
 - 5. Cants
- B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 19 percent maximum moisture content and the following species: Mixed southern pine; SPIB.

- C. For concealed boards, provide lumber with 19 percent maximum moisture content of the following species and grades:
 - 1. Spruce-pine-fir (south) or Spruce-pine-fir, Construction or 2 Common grade; NELMA, NLGA, WCLIB, or WWPA.

2.5 PLYWOOD PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch (12.7 mm) thick.
 - 1. Paint before mounting of equipment.
- B. Plywood Subfloor: DOC PS 1, Exposure 1, Structural I sheathing; span rating to suit framing in each location and in thickness indicated.
- C. Miscellaneous Concealed Plywood: Exposure 1 sheathing, span rating to suit framing in each location, and thickness as indicated but not less than ½ inch (13 mm).
 - 1. Provide fire-retardant-treated panels for interior locations unless indicated.
 - 2. Provide preservative-treated panels for exterior locations unless indicated.

2.6 MISCELLANEOUS MATERIALS

- A. Fasteners:
 - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
 - 2. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.7 ACCESSORY MATERIALS

A. Weather Resistant Barrier: Asphalt-saturated organic felt, ASTM D 226, Type 1 (No. 15 asphalt felt), unperforated.

PART 3 - EXECUTION

- 3.1 INSTALLATION
 - A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
 - B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for

accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

- C. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- D. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.
- E. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.
- 3.2 PANEL PRODUCT INSTALLATION
 - A. Fastening Methods: Fasten panels as indicated below:
 - 1. Plywood Backing Panels: Screw to supports.
 - 2. Miscellaneous Concealed Plywood Panels: Screw to supports.
 - 3. Plywood Subfloor: Screw to supports.
- 3.3 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.
 - B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

END OF SECTION 061053

SECTION 064020 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes the following:
 - 1. Wood cabinets and casework, including built-in bookcases and storage units.
 - 2. Interior wood trim and rails
 - 3. Wood seating (banquette).
 - 4. Riser cladding and trim at learning stairs.
 - B. Millwork scope includes the following:
 - 1. Learning stairs in Library.
 - 2. Bookcases in Library.
 - 3. Wood seating booth and wrap in the Cafe.
 - C. Related Work Specified Elsewhere:
 - 1. Wood floor finish at learning stairs is specified in Division 09 Section "Wood Flooring."
 - 2. Composite quartz countertops are specified in Division 12 Section "Simulated Stone Countertops."
- 1.2 DEFINITIONS
 - A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items, unless concealed within other construction before woodwork installation.
- 1.3 SUBMITTALS
 - A. Product Data: For each type of product indicated, including cabinet hardware and accessories, and finishing materials and processes.
 - B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show details full size.
 - 2. Show locations and sizes of furring, blocking, and hanging strips and clips, cabling and connectors, and attachment devices, including concealed blocking and reinforcement specified in other Sections.
 - 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, wire management, and other items installed in architectural woodwork.

- C. Samples for Verification: For the following:
 - 1. Lumber with or for transparent finish, 50 sq. in. (300 sq. cm), for each species and cut, finished on 1 side and 1 edge.
 - 2. Wood-veneer-faced panel products with or for transparent finish, 8 by 10 inches (200 by 250 mm), for each species and cut. Include at least one face-veneer seam and finish as specified.
- D. Product Certificates: Signed by manufacturers of woodwork certifying that products furnished comply with requirements.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production and installation of interior architectural woodwork.
- C. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork, construction, finishes, and other requirements.
 - 1. Provide AWI Quality Certification Program certificate indicating that woodwork complies with requirements of grades specified.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.
- 1.6 PROJECT CONDITIONS
 - A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
 - B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate

measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

- 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
- 1.7 COORDINATION
 - A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

- 2.1 MATERIALS, GENERAL
 - A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
 - B. Low-Emitting Materials: All composite wood, engineered wood, or agrifber products (e.g., plywood, particleboard, medium density fiberboard) shall contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI)
 - C. Wood Species and Cut for Transparent Finish: Grade A Maple, plain sawn/sliced.
 - 1. Matching: Solid stock shall be matched for color and grain; veneer faces shall be compatible in color with solid stock.
 - 2. Veneer Matching: Slip matched and balanced within panel.
 - D. Wood Species and Cut for Stair Risers: Match wood flooring species and cut; refer to Division 09 Section "Wood Flooring."
 - E. Wood Products: Comply with the following:
 - 1. Hardboard: Tempered, S1S, Class 1 minimum 1/4 inch and conforming to PS 58-73.
 - 2. Particleboard: Minimum 45 lb. density particleboard complying with requirements in ANSI A208.1, Grade M 3i.
 - 3. Medium-Density Fiberboard: ANSI A208.2, Grade 130
 - 4. Softwood Plywood: DOC PS 1, Medium Density Overlay.
 - 5. Hardwood Plywood and Face Veneers: HPVA HP-1.

- F. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Wood Glues: 30 g/L.
 - 2. Contact Adhesive: 80 g/L.

2.2 INSTALLATION MATERIALS

- A. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- 2.3 FABRICATION, GENERAL
 - A. Interior Woodwork Grade: Provide Premium grade interior woodwork complying with the referenced quality standard.
 - B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
 - C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm)
 - D. Complete fabrication, including assembly, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
 - E. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
- 2.4 INTERIOR WOOD TRIM AND RAILS
 - A. Quality Standard: Comply with AWI Section 6.

- B. Grade: Premium, for transparent finish items.
- C. For trim items wider than available lumber, use veneered construction. Do not glue for width.
- D. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work
- E. Assemble casings in plant except where limitations of access to place of installation require field assembly.
- F. Assemble moldings in plant to maximum extent possible. Miter corners in plant and prepare for field assembly with bolted fittings designed to pull connections together.
- 2.5 WOOD CABINETS AND CASEWORK FOR TRANSPARENT FINISH
 - A. Quality Standard: Comply with AWI Section 10 requirements for custom wood cabinets.
 - B. Grade:
 - 1. Premium, for transparent finish items.
 - C. Wood Species and Cut for Exposed Surfaces: As specified above.
 - D. Grain and Veneer Matching: As specified above
- 2.6 STAIRWORK AND HANDRAILS
 - A. Quality Standard: Comply with AWI Section 7.
 - B. Grade: Premium.
 - C. Wood Species: As specified above.
 - D. Finishes for Stair Parts: Transparent finish; comply with Division 09 Section "Wood Flooring."
- 2.7 SHOP FINISHING
 - A. Quality Standard: Comply with AWI Section 5, unless otherwise indicated.
 - 1. Grade: Provide finishes of same grades as items to be finished.
 - B. General:
 - 1. Finish all transparent finished architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

- C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative overlay.
- D. Transparent Finish: Comply with requirements indicated below for grade, finish system, staining, and sheen, with sheen measured on 60-degree gloss meter per ASTM D 523:
 - 1. AWI Finish System 9: UV Curable, Acrylated Epoxy, Polyester or Urethane.
 - 2. Staining: As selected by Architect.
 - 3. Wash Coat for Stained Finish: Apply a vinyl wash coat to woodwork made from closed-grain wood before staining and finishing.
 - 4. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
 - 5. Sheen: Satin.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Sections cited for fabrication and in the same grade, as specified in Part 2 of this Section for type of woodwork involved
- B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

- E. Wood Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches (900 mm) long, except where shorter single-length pieces are necessary.
 - 1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base, if finished.
 - 2. Install trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).
- F. Cabinets and Casework: Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Maintain veneer sequence matching of cabinets with transparent finish.
 - 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish
- G. Complete the finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail holes with matching filler where exposed. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats were applied in shop.
- 3.3 ADJUSTING AND CLEANING
 - A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
 - B. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064020

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in fire-resistance-rate horizontal assemblies.
 - 3. Penetrations in non-fire-resistance-rate horizontal assemblies.
 - 4. Penetrations in smoke barriers, smoke partitions and smoke tight partitions.
- B. Related Sections:
 - 1. Section 078446 "Fire-Resistive Joint Systems" for joints in or between fireresistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product indicated.
 - B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
 - 1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For qualified Installer.
 - B. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
 - C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

- B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:
 - 1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
 - b. Classification markings on penetration firestopping correspond to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek ETL SEMKO in its "Directory of Listed Building Products."
 - 3) FM Global in its "Building Materials Approval Guide."
- C. Preinstallation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.6 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.
- C. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

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. Penetration Firestop Systems specified in the Schedule in Part 3 include:
 - a. Fire Barrier Products, 3M Fire Protection Products
 - b. RectorSeal Corporation.
 - 2. Subject to compliance with specified requirements, provide Penetration Firestop Systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory (BXRH), by one of the following:
 - a. Hilti, Inc.
 - b. Nelson Firestop Products.
 - c. RectorSeal Corporation.
 - d. Specified Technologies Inc.
 - e. 3M Fire Protection Products.
 - f. Wiremold/Legrand

2.2 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls, and fire partitions.
 - 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. Horizontal assemblies include floors and floor/ceiling assemblies.
 - 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 - 3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
 - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.

- E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.
- F. Exposed Penetration Firestopping: Provide products with flame-spread and smokedeveloped indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- G. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- H. 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 manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
 - 1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-wool-fiber or rock-wool-fiber insulation.
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants.
 - 2. Temporary forming materials.
 - 3. Substrate primers.
 - 4. Collars.
 - 5. 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 metallic sleeve lined with an intumescent strip, a radial extended 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 elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

- 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 of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.
- 2.4 MIXING
 - A. For those products requiring mixing before application, comply with penetration firestopping 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.
- 3.2 PREPARATION
 - A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping 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.

- 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
- 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

- A. General: Install penetration firestopping 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 fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. 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.
- B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.
- C. Proceed with enclosing penetration firestopping 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 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 is 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 and install new materials to produce systems complying with specified requirements.

3.7 PENETRATION FIRESTOPPING 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 penetrations in non-fire rated horizontal assemblies, smoke barriers, smoke partitions and smoke tight partitions, provide systems tested for 1 hour unless otherwise noted.
- C. Basis of Design Assemblies: Subject to compliance with requirements, provide the design indicated below or a comparable UL design by one of manufacturer's listed in Part 2 above.
 - 1. Schedule of construction components, type of penetrant, and U.L. Penetration Firestop Systems include, but are not limited to the following:
 - 2. Schedule of construction components, type of penetrant, and U.L. Penetration Firestop Systems include, but are not limited to the following:

PENETRANT

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	Metal Conduit	Cable Tray⁴	Cables	Non- Insul. Metal Pipe	Insul. Pipe	FR Polypro- pylene Pipe	Insul. Metal Duct
GWB Stud Wall, or Shaft Wall up to 2 Hr Rating	W-L- 1001	W-L- 4004	W-L- 3001	W-L- 1001	W-L- 5011	W-L- 2002	W-L- 7006 ³
CMU Wall up to 2 Hr Rating	C-AJ 1044	C-AJ- 4003	C-AJ- 3030	C-AJ- 1044	C-AJ- 5001	C-AJ- 2001	C-AJ- 7003 ³ , 7016 ³
Concrete Floor / Metal Deck 1 Hr Rated F and T- Rating ²	C-AJ- 1008	N/A	C-AJ- 3029	C-AJ- 1008	C-AJ- 5002	F-A- 2002	C-AJ- 7009⁵
Concrete Floor / Metal Deck 2 Hr Rated F and T- Rating ²	C-AJ- 1008	N/A	C-AJ- 3029	C-AJ- 1008	C-AJ- 5060	F-A- 2002	N/A
Concrete Floor / Metal Deck up to 2 Hr F Rated ¹	F-A- 1002	N/A	C-AJ- 3030	C-AJ- 1044	C-AJ- 5001	F-A- 2002	N/A

KEY TO NOTES

- 1. Penetration within wall cavity.
- 2. Penetration that does not fall within wall cavity, T-Rating required.
- 3. Up to 1 hour rating, submit engineered judgement firestopping system for this combination of penetrant, wall/floor assembly, and fire rating. Install fire dampers in 2-hour walls in accordance with manufacturer's instructions and testing agency requirements.
- 4. Where cable tray extends through wall.
- 5. For floor penetrations not enclosed above and below the floor with shaft wall.
- D. Membrane Penetrations:

- 1. Firestop membrane penetrations by cables, pipes and conduit similar to through wall penetrations.
- 2. Provide putty pad box wrap firestopping for membrane penetrations in rated walls for electrical back boxes over 16 sq. inches, where any back boxes are located within 24 inches horizontal of another back box, or when total area of back boxes exceeds 100 sq in. in 100 sq. ft. of wall area.
- E. Where another type of construction or penetrant is encountered, or if field conditions vary from those described in the U.L. System listed (i.e. annular space is greater/smaller, insulation type varies, etc.), provide firestopping systems which are appropriate, and U.L. tested, for that condition.

END OF SECTION 078413

SECTION 078446 - FIRE-RESISTIVE JOINT SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Joints in or between fire-resistance-rated constructions.
 - 2. Joints in smoke barriers.
- B. Related Sections:
 - 1. Section 078413 "Penetration Firestopping" for penetrations in fire-resistancerated walls, horizontal assemblies, and smoke barriers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Schedule: For each fire-resistive joint system. Include location and design designation of qualified testing agency.
 - 1. Where Project conditions require modification to a qualified testing agency's illustration for a particular fire-resistive joint system condition, submit illustration, with modifications marked, approved by fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Installer Certificates: From Installer indicating fire-resistive joint systems have been installed in compliance with requirements and manufacturer's written recommendations.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fire-resistive joint systems.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing fire-resistive joint systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its fire-resistive joint

system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

- B. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:
 - 1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
 - a. Fire-resistive joint system products bear classification marking of qualified testing agency.
 - b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."
- C. Preinstallation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.6 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 FIRE-RESISTIVE JOINT SYSTEMS

A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall

accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

- B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:
 - 1. Joints include those installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies.
 - 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
 - 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. Grace Construction Products.
 - b. Hilti, Inc.
 - c. RectorSeal Corporation.
 - d. Specified Technologies Inc.
 - e. 3M Fire Protection Products.
 - f. Tremco, Inc.; Tremco Fire Protection Systems Group.
- C. Joints in Smoke Barriers: Provide fire-resistive joint systems with ratings determined per UL 2079.
 - 1. L-Rating: Not exceeding 5.0 cfm/ft (0.00775 cu. m/s x m) of joint at 0.30 inch wg (74.7 Pa) at both ambient and elevated temperatures.
 - 2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Grace Construction Products.
 - b. Hilti, Inc.
 - c. Johns Manville.
 - d. RectorSeal Corporation.
 - e. Specified Technologies Inc.
 - f. 3M Fire Protection Products.
 - g. Tremco, Inc.; Tremco Fire Protection Systems Group.
- D. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- E. VOC Content: Fire-resistive joint system sealants shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- F. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to maintain ratings

required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

3.3 INSTALLATION

- A. General: Install fire-resistive joint 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 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 fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

- C. Install fill materials for fire-resistive joint 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 fill 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. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of joint edge so labels will be visible to anyone seeking to remove or penetrate joint 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 Fire-Resistive Joint System Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing 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.
- B. Where deficiencies are found or fire-resistive joint systems are damaged or removed due to testing, repair or replace fire-resistive joint systems so they comply with requirements.
- C. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

3.7 FIRE-RESISTIVE JOINT SYSTEM / FIRESTOP JOINT SYSTEM SCHEDULE

A. Where UL-classified firestop joint systems are indicated, they refer to alphanumeric designations listed in UL's "Fire Resistance Directory" under product Category XHBN.

Firestop Joint System Location	Basis- of- Design	Assembly Rating	Nominal Joint Width	Movement Capabilities ²
Floor-to-Wall				
Rated concrete masonry wall construction intersection with adjacent floor construction	FW-D- 1012, FW-D- 1013	1 hour or 2 hours ¹	As indicated, or required by tested assembly	Class II
Head-of-Wall				
Rated gypsum wall construction intersection with steel floor deck above	HW-D- 0087, or HW-D- 0089	1 hour or 2 hours ¹	As indicated, or required by tested assembly	Class II or III,
Rated gypsum wall construction intersection with concrete floor deck above	HW-D- 0083, HW-D- 209	1 hour or 2 hours ¹	As indicated, or required by tested assembly	Class II
Rated concrete masonry wall construction intersection with steel floor deck above	HW-D- 0081, or HW-D- 0098	1 hour or 2 hours ¹	As indicated, or required by tested assembly	Class II
Rated concrete masonry wall construction intersection with concrete floor deck above	HW-D- 0268, HW-D- 0097	1 hour or 2 hours ¹	As indicated, or required by tested assembly	Class II
Bottom-of-Wall				
Rated gypsum wall construction intersection with concrete floor	BW-S- 0002	1 hour or 2 hours ¹	As indicated, or required by tested assembly	Static

1. Rating to match wall construction.

- 2. Class UL2079
 - B. Where another type of construction is encountered, or if field conditions vary from those described in the U.L. System listed (i.e. annular space is greater/smaller,

insulation type varies, etc.), provide firestopping systems which are appropriate, and U.L. tested, for that condition.

END OF SECTION 078446

ATTACHMENT: FIRESTOP JOINT SYSTEMS SUBMITTAL SHEET

3.8 FIRESTOP JOINT SYSTEMS SUBMITTAL SHEET

- A. **HEAD-OF-WALL FIRESTOPPING:** Fill in the U.L. Design number and attach copy of U.L. Test. Insert n/a if condition is not applicable.
 - 1. Gypsum wall construction intersection with floor deck above: _____. Gypsum wall construction intersection with roof deck above: _____.
 - 2. Concrete masonry wall construction intersection with floor deck above:
 - 3. Concrete masonry wall construction intersection with roof deck above:
- B. **FLOOR-TO-WALL FIRESTOPPING:** Fill in the U.L. Design number and attach copy of U.L. Test. Insert n/a if condition is not applicable.
 - 1. Concrete masonry wall construction intersection with adjacent floor construction:
- C. **BOTTOM-OF-WALL FIRESTOPPING:** Fill in the U.L. Design number and attach copy of U.L. Test. Insert n/a if condition is not applicable.
 - 1. Gypsum wall construction intersection with floor deck: ______. Gypsum wall construction intersection with roof deck above: ______.
 - 2. Concrete masonry wall construction intersection with floor ____
 - 3. Concrete masonry wall construction intersection with roof deck above:
- D. **CURTAIN WALL FIRESTOPPING:** Fill in the design number and copy test. Insert n/a if condition is not applicable.
 - 1. Aluminum mullion and glass spandrel panel curtainwall intersection with adjacent floor construction:
 - 2. Gypsum sheathed curtainwall intersection with adjacent floor construction:
- E. **OTHER:** Where another type of construction or penetrant is encountered, attach a separate sheet listing each condition and attach copy of the U.L. Test.

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes joint sealants for the following locations:
 - 1. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:
 - a. Control and expansion joints in cast-in-place concrete
 - b. Joints in cast stone wall surfaces.
 - c. Joints in brick veneer wall surfaces.
 - d. Joints at stone steps.
 - e. Joints between different materials listed above
 - f. Perimeter joints between materials listed above and frames of doors, louvers and windows.
 - g. Control and expansion joints in ceiling and overhead surfaces.
 - h. Other joints as indicated.
 - 2. Exterior joints in the following horizontal traffic surfaces:
 - a. Control, expansion, and isolation joints in cast-in-place concrete slabs and steps.
 - b. Joints at stone steps.
 - c. Other joints as indicated.
 - 3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
 - d. Perimeter joints between interior wall surfaces and frames of interior door frames, storefront framing, and entrances.
 - e. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - f. Tile control and expansion joints
 - g. Openings and joints in sound-rated partitions.
 - h. Other joints as indicated.
 - 4. Interior joints in the following horizontal traffic surfaces:
 - a. Control and expansion joints in cast-in-place concrete slabs.
 - b. Other joints as indicated.
- B. Related Sections include the following:

- 1. Sealants used in glazing are specified in Division 08 "Glazing."
- 2. Coordinate work of this section with all sections referencing it.

1.2 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- C. Samples for verification purposes of each type and color of joint sealant required. Install joint sealant samples in 1/2-inch (13-mm)) wide joints formed between two 6-inch (150-mm) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

1.4 INFORMATIONAL SUBMITTALS

- A. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.
- B. Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project names addresses, names of Architects and Owners, plus other information specified.
- C. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
- D. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.
- E. Preconstruction field test reports indicating which products and joint preparation methods demonstrate acceptable adhesion to joint substrates.
- F. Warranties: Special warranties specified in this Section.
- 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an installer who has successfully completed at least three (3) joint sealer applications similar in type and size to that of this project within the last five (5) years. All workers used for work of this Section shall be experienced in the techniques of sealant application and shall be completely familiar with the published recommendations of the manufacturer of the joint sealant materials being used.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Preconstruction Field Testing: Prior to installation of joint sealants, field-test their adhesion to joint substrates as follows:
 - 1. Locate test joints where indicated or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of non-elastomeric sealant and joint substrate indicated.
 - 3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
 - 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
 - 5. Test Method: Test joint sealants by hand pull method described below:
 - a. Install joint sealants in 60 inches (1500 mm)) joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing.
 - b. Make knife cuts horizontally from one side of joint to the other followed by 2 vertical cuts approximately 2 inches (50 mm) long at side of joint and meeting horizontal cut at top of 2-inch (50-mm) cuts. Place a mark 1 inch (25 mm) from top of 2-inch (50-mm) piece.
 - c. Use fingers to grasp 2-inch (50-mm) piece of sealant just above 1-inch (25mm) mark; pull firmly down at a 90-degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
 - 6. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
 - 7. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
- D. Field-Constructed Mock-Ups: Prior to installation of joint sealants, apply elastomeric sealants as follows to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution:

- 1. Joints in field-constructed mock-ups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants specified in this Section.
- E. Pre-Installation Conference: Conduct conference at Project site to comply with requirements of the Division 01 Section covering this activity.
- F. Random Field Tests: Periodically test sealants, in place, for adhesion, using methods recommended by sealant manufacturer. Promptly replace any sealant that does not adhere, fails to cure, or fails to perform as specified by the sealant manufacturer.
- G. Field Water Test: Perform two field water tests on completed areas including as many conditions as possible. If leakage occurs during testing, repair as required, and re-test area and also test two additional locations.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
 - B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.
- 1.7 PROJECT CONDITIONS
 - A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4 deg C).
 - 2. When joint substrates are wet.
 - B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
 - C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.
- 1.8 COORDINATION
 - A. Coordinate the work with all sections referencing this section.
- 1.9 WARRANTY
 - A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

- 1. Warranty Period: Two years from date of Substantial Completion.
- B. Manufacturer's Warranty: Provide written warranty agreeing to repair or replace, at no cost to Owner, defective materials for twenty (20) years, and workmanship for two (2) years from the Date of Substantial Completion. Defective materials and workmanship shall include, but are not limited to:
 - 1. Deterioration, aging or weathering of the work;
 - 2. Water leakage and/or air leakage;
 - 3. Sealant loss of adhesion, loss of cohesion, cracking or discoloration;
 - 4. Staining or discoloration of adjacent surfaces;
 - 5. Joint failure due to building or joint movement up to the limits prescribed by the manufacturer;
 - 6. Cracks or bubbles on sealant surface.

PART 2 - PRODUCTS

- 2.1 MATERIALS, GENERAL
 - A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - B. Colors: Provide color of exposed joint sealants to comply with the following:
 - 1. Provide selections made by Architect from manufacturer's standards or custom colors to match Architect's samples, as directed by Architect.
 - C. Additional Movement Capability: Where additional movement capability is specified, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for Uses indicated.
 - D. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
 - E. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project
- 2.2 LATEX JOINT SEALANT

- A. Acrylic-Emulsion Sealant: Manufacturer's standard, one part, nonsag, mildew-resistant, paintable latex acrylic-emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior locations involving joint movement of not more than plus or minus 5 percent.
 - 1. Available Products: Subject to compliance with requirements, latex joint sealants that may be incorporated in the Work include, but are not limited to, the following:
 - a. AC-20; Pecora Corporation.
 - b. Tremflex 834; Tremco.
 - c. ALEX PLUS; DAP .
- B. Uses: General interior use, paintable.
- 2.3 MILDEW-RESISTANT SILICONE JOINT SEALANT
 - A. Single-Component Mildew-Resistant Silicone Sealant: Manufacturer's standard, nonmodified, one-part, silicone sealant; complying with ASTM C 920, Type S, Grade NS, Class 25, Uses NT, G, A, and, as applicable to non-porous joint substrates indicated, O. Formulate sealant with fungicide and specifically intended for sealing interior joints with nonporous substrates and subject to in-service exposure to conditions of high humidity and temperature extremes.
 - 1. Available Products: Subject to compliance with requirements, silicone joint sealants that may be incorporated in the Work include, but are not limited to, the following:
 - a. 786 Mildew Resistant; Dow Corning.
 - b. Sanitary 1700; GE Silicones.
 - c. 898 Silicone Sanitary Sealant; Pecora Corporation.
 - d. Tremsil 600 White; Tremco.
 - B. Uses: Interior use in wet locations, and all toilet and shower rooms.
- 2.4 NONSAG URETHANE JOINT SEALANT
 - A. Multicomponent Nonsag Urethane Sealant: Manufacturer's standard, non-modified, multipart, nonsag urethane sealant; complying with ASTM C 920, Type M, Grade NS, Class 25, Uses NT, M, G, A, and as applicable to joint substrates indicated, O.
 - 1. Available Products: Subject to compliance with requirements, urethane joint sealants that may be incorporated in the Work include, but are not limited to, the following:
 - a. Dynatrol II, Pecora Corporation
 - b. Sikaflex-2c NS, Sika Corporation
 - c. Dymeric 240FC; Tremco.
 - d. Masterseal NP 2; Master Builders Solutions Div., BASF
 - B. Uses: Interior use for exposed concrete or masonry wall control joints
- 2.5 SILICONE JOINT SEALANT

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100, for Use G, A, M, O; non-staining and field-tintable.
 - 1. Basis of Design Product: Provide Pecora Corporation "890FTS" sealant or equal manufactured by one of the following:
 - a. Dow Corning Corporation.
 - b. GE Advanced Materials Silicones
 - c. Sika Corporation, Construction Products Division
 - d. Tremco Incorporated
- B. Additional Movement Capability: 100 percent movement in extension and 50 percent in compression for a total of 150 percent movement.
- C. Uses: General exterior use.
- 2.6 POURABLE URETHANE JOINT SEALANT
 - A. Multicomponent Pourable Urethane Sealant: Manufacturer's standard, non-modified, twopart, urethane sealant; complying with ASTM C 920, Type M, Grade P, Class 25, Uses T, M, A and, as applicable to joint substrates indicated, O.
 - 1. Available Products: Subject to compliance with requirements, urethane joint sealants that may be incorporated in the Work include, but are not limited to, the following:
 - a. NR-200 Urexpan, Pecora Corporation
 - b. Sikaflex 2c SL, Sika Corporation
 - c. Masterseal SL 2; Master Builders Solutions Div., BASF
 - B. Uses: Interior or exterior use for level pavement or slab joints.
- 2.7 NONSAG URETHANE JOINT SEALANT
 - A. Multi-Part Non-Sag Urethane Sealant: Except as otherwise indicated, provide manufacturer's standard, non-modified, two-part, urethane sealant; complying with ASTM C 920, Type M, Grade NS, Class 25, Uses T, M, A and, as applicable to joint substrates indicated, O.
 - 1. Available Products: Subject to compliance with requirements, urethane joint sealants that may be incorporated in the Work include, but are not limited to, the following:
 - a. Sikaflex 2c NS; Sika Corp
 - b. Dynatred, Pecora Corporation
 - c. Masterseal NP 2; Master Builders Solutions Div., BASF
 - B. Uses: Interior or exterior use for pavement or slab joints where slope exceeds one percent.
- 2.8 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant: Non-sag (gun grade), non-flammable, latex-based sealant designed to limit sound transmission through interior STC-rated partitions. Sealant remains flexible and adhered to metal, wood, plaster, gypsum, and concrete after drying.
 - 1. Maintains the STC rating of partitions with intersections and penetrations sealed with product: Tested by independent, accredited, NVLAP facility according to ASTM E 90.
 - 2. Products: Provide one of the following:
 - a. QuietZone Acoustic Sealant by Owens Corning.
 - b. OSI GreenSeries SC-175 Draft & Acoustical Sound Sealant by Henkel Corporation
 - c. Pecora AIS-919: Acoustical and Insulation Latex Sealant by Pecora Corporation
 - d. Smoke 'N' Sound Acoustical Sealant by Specified Technologies Inc.
- B. Uses: At penetrations through and intersections of sound-rated wall, floor and ceiling assemblies in order to preserve their ability to reduce airborne sound impact noise transmission.

2.9 PREFORMED FOAM SEALANTS

- A. Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water repellent agent; factory-produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements:
 - 1. Properties: Permanently elastic, mildew-resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
 - 2. Impregnating Agent: Chemically stabilized acrylic.
 - 3. Density: Manufacturer's standard.
 - 4. Backing: None.
 - 5. Available Products: Subject to compliance with requirements, preformed foam sealants that may be incorporated in the Work include, but are not limited to, the following:
 - a. "Emseal," Emseal Corp.
 - b. "Emseal Greyflex," Emseal Corp.
 - c. "Wil-Seal 150," Wil-Seal Construction Foams Div., Illbruck.
 - d. "Wil-Seal 250," Wil-Seal Construction Foams Div., Illbruck.

2.10 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 - 1. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
 - 2. Manufacturer: Provide Cera-Rod manufactured by W.R. Meadows, Inc., or equivalent.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- 2.11 JOINT FILLERS FOR EXTERIOR CONCRETE SLABS
 - A. General: Provide joint fillers of thickness and depth indicated, or if not indicated 1/2" thick by depth of joint.
 - B. Bituminous Fiber Joint Filler: Provide preformed strips of with asphalt binder encased between two layers of saturated felt or glass-fiber felt, complying with ASTM D 1751.
 - 1. Protect top edge of joint filler during concrete placement with a metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint and seal with sealant.

2.12 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 in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions

affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer 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 concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

- 1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 - 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
- F. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's recommendations.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved 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 or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or

deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the following hollow-metal work:
 - 1. Steel door frames
- B. Related Requirements:
 - 1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to SDI A250.8.

1.3 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.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 2. Locations of reinforcement and preparations for hardware.
 - 3. Details of each different wall opening condition.
 - 4. Details of anchorages, joints, field splices, and connections.
 - 5. Details of accessories.
 - 6. Details of conduit and preparations for power, signal, and control systems.
- C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.
- 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work 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, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) 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 Products; an Assa Abloy Group company.
 - 2. Curries Company; an Assa Abloy Group company.
 - 3. Republic Doors and Frames; an Allegion group company.
 - 4. Steelcraft; an Allegion group company.
 - B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.
- 2.2 PERFORMANCE REQUIREMENTS
 - A. Fire-Rated 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 at positive pressure according to NFPA 252 or UL 10C.
 - B. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Frames: SDI A250.8, Level 3. Provide for interior frame locations.
 - 1. Physical Performance: Level A according to SDI A250.4.
 - 2. Materials: Minimum thickness of 16 gage, 0.053 inch (1.3 mm), uncoated, steel sheet.

- 3. Construction: Full profile welded.
- 4. Exposed Finish: Prime door and frames

2.4 FRAME ANCHORS

- A. Jamb Anchors:.
 - 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.5 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. 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.
- G. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.6 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness.

Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

- B. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Sidelight and Transom Bar 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 butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
 - b. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
 - 5. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
 - 6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- C. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surfacemounted door hardware.

- 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- 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 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. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 PREPARATION
 - A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
 - B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
- 3.3 INSTALLATION
 - A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
 - B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

- a. At fire-rated openings, install frames according to NFPA 80.
- b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
- c. Install frames with removable stops located on secure side of opening.
- d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
- e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
- 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
- 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
- 4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid-core doors with wood-veneer faces for transparent finish.
 - 2. Factory finishing flush wood doors.
 - 3. Factory fitting flush wood doors to frames and factory machining for hardware.
- B. Related Requirements:
 - 1. Division 08 Section "Hollow Metal Doors and Frames" for steel door frames.
 - 2. Division 08 Section "Glazing" for glass view panels in flush wood doors

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction, louvers, and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
 - 1. Dimensions and locations of blocking.
 - 2. Dimensions and locations of mortises and holes for hardware.
 - 3. Dimensions and locations of cutouts.
 - 4. Undercuts.
 - 5. Requirements for veneer matching.
 - 6. Doors to be factory finished and finish requirements.
 - 7. Fire-protection ratings for fire-rated doors.
 - 8. Provide schedule of doors based on door schedule included in contract documents
- C. Samples for Initial Selection: For factory-finished doors.
- D. Samples for Verification:
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), 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.
 - 2. Frames for light openings, 6 inches (150 mm) long, for each material, type, and finish required.

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- 3. Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edges representing actual materials to be used.
 - a. Provide Samples for each species of veneer and solid lumber required.
 - b. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For door inspector.
 - 1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1
 - 2. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4
- B. Sample Warranty: For special warranty.
- C. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- D. Field quality control reports.
- 1.5 QUALITY ASSURANCE
 - A. Fire-Rated Door Inspector Qualifications: Inspector for field quality-control inspections of fire-rated door assemblies complies with qualifications set forth in NFPA 80, Section 5.2.3.1
 - B. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies complies with qualifications set forth in NFPA 101, Section 7.2.1.15.4
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Comply with requirements of referenced standard and manufacturer's written instructions.
 - B. Package doors individually in plastic bags or cardboard cartons.
 - C. Mark each door on top and bottom rail with opening number used on Shop Drawings.
- 1.7 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 HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during remainder of construction period.

1.8 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. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84inch (1067-by-2134-mm) section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) 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.
- B. Contractor's Responsibilities: Replace doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty

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. Marshfield Algoma by Masonite Architectural
 - 2. Oshkosh Door Company.
 - 3. VT Industries, Inc. (formerly Eggers)
 - B. Source Limitations: Obtain flush wood doors from single manufacturer.
- 2.2 FLUSH WOOD DOORS, GENERAL
 - A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."
 - 1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.
 - 2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
 - B. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.
 - C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C. After 5 minutes into the NFPA 252 test, the neutral pressure level in the furnace shall be established at 40 inches

(1016 mm) or less above the sill. Provide "Category A" Positive Pressure Tested doors for all fire-rated wood doors.

- 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- 2. Cores: Provide core specified or mineral core as needed to provide fireprotection rating indicated.
- 3. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile; UL category A. Comply with specified requirements for exposed edges.
- 4. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
- D. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- E. Particleboard-Core Doors:
 - 1. Particleboard: ANSI A208.1, Grade LD-2, made with binder containing no ureaformaldehyde.
 - 2. Blocking: Provide wood blocking in particleboard-core doors as follows:
 - a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
 - b. 5-inch (125-mm) bottom-rail blocking, in doors and doors indicated to have kick, mop, or armor plates.
 - c. 4-1/2-by-10-inch (114-by-250-mm) lock blocks and 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.
- F. Structural-Composite-Lumber-Core Doors:
 - 1. Structural Composite Lumber: WDMA I.S.10.
 - a. Screw Withdrawal, Face: 700 lbf (3100 N).
 - b. Screw Withdrawal, Edge: 400 lbf (1780 N).
- G. Mineral-Core Doors:
 - 1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
 - 2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware, and as follows:
 - a. 5-inch (125-mm) top-rail blocking.
 - b. 5-inch (125-mm) bottom-rail blocking, in doors indicated to have protection plates.
 - c. 5-inch (125-mm) midrail blocking, in doors indicated to have armor plates.

- d. 4-1/2-by-10-inch (114-by-250-mm) lock blocks and 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.
- 3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
 - a. Screw-Holding Capability: 550 lbf (2440 N) per WDMA T.M.-10.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Solid-Core Doors:
 - 1. Grade: Custom, with Grade A faces.
 - 2. Species: Provide one of the following where scheduled on Drawings (some doors have one species on one face and the other species on the other face):
 - a. Red oak
 - b. Maple
 - 3. Cut: Plain sliced.
 - 4. Match between Veneer Leaves: Book match.
 - 5. Assembly of Veneer Leaves on Door Faces: Balance match.
 - 6. Exposed Vertical Edges: Same species as faces edge Type A
 - 7. Core:
 - a. Non-Rated Doors: Particleboard except provide doors with either gluedwood-stave or structural-composite-lumber cores instead of particleboard cores for doors with full light or 2 lights
 - b. Fire-Rated Doors: Mineral core.
 - 8. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
 - 9. WDMA I.S.1-A Performance Grade: Extra Heavy Duty
 - 10. Basis of Design Doors: Marshfield Algoma Aspiro Series by Masonite Architectural, or equal.

2.4 LIGHT FRAMES AND LOUVERS

- A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
 - 1. Wood Species: Same species as door faces.
 - 2. Profile: Manufacturer's standard shape.
 - 3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.
- B. Wood-Veneered Beads for Light Openings in Fire-Rated Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Align and fit doors in frames with uniform clearances and bevels as indicated below. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 5/8 inch (16 mm) from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
 - 3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.
- C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
- D. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining. 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. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Transparent Finish:
 - 1. Grade: Premium.
 - 2. Finish: WDMA TR-6 and AWS system 11 catalyzed polyurethane.
 - 3. Staining: As selected by Architect for each wood species.
 - 4. Effect: Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores.
 - 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.
- 3.2 INSTALLATION
 - A. Hardware: For installation, see Division 08 Section "Door Hardware."
 - B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated doors according to NFPA 80.
 - 2. Install smoke- and draft-control doors according to NFPA 105.
 - C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
 - D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- 3.3 FIELD QUALITY CONTROL
 - A. Inspection Agency: Engage a qualified inspector to perform inspections and commissioning activities 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.
 - 2. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.
 - C. Commissioning: Commissioning of all doors shall be performed by the installer supervised by an Architectural Hardware Consultant who is thoroughly knowledgeable of the various components and systems. Include the following:
 - 1. Testing of opening force, closing device, complete closure of the door within clearance tolerances, and full engagement of latch(es) where required by door type.
 - 2. Verify cleanliness of labels, fusible links and other components that cannot be painted.

- 3. Functional testing of automatic-closing or power-operated fire door assemblies and electrically controlled latching hardware or release devices shall be coordinated with all components of the electrically controlled system.
- 4. After all doors have been commissioned and prior their acceptance, the Architect, in consultation with the Owner, will select doors (at least one for each operational type) whose full range operation shall be demonstrated by the Contractor to the satisfaction of the Architect.
- D. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- E. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- F. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.
- G. Prepare and submit separate inspection report for each egress door assembly indicating compliance with each item listed in NFPA 101.
- H. Prepare and submit commissioning report of all doors.

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 081416

SECTION 082250 - POLYESTER FACED DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Fiberglass reinforced polyester (FRP) faced doors, fire rated.
 - 2. Installation of hardware (except surface mounted hardware).
- B. Related sections include the following:
 - 1. Division 07 Section "Joint Sealants" for joint sealants installed as part of aluminum entrance and storefront systems.
 - 2. Division 08 Section "Hollow Metal Doors and Frames" for frames.
 - 3. Division 08 Section "Door Hardware."
 - 4. Division 08 Section "Glazing."

1.2 SYSTEM DESCRIPTION

- A. General: Provide polyester faced doors capable of withstanding loads and thermal and structural movement requirements indicated without failure, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Thermal Movements: Provide polyester faced doors and aluminum framing systems, including anchorage, that accommodate thermal movements of systems and supporting elements resulting from the following maximum change(range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, failure of doors or other operating units to function properly, and other detrimental effects.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- C. Structural-Support Movement: Provide polyester faced doors and aluminum framing systems that accommodate structural movements including, but not limited to, sway and deflection.
- D. Dimensional Tolerances: Provide polyester faced doors and aluminum framing systems that accommodate dimensional tolerances of building frame and other adjacent construction.

1.3 SUBMITTALS

A. Product data including specifications, standard details, and installation recommendations for polyester faced doors and panels and aluminum frames including test reports

certifying that products have been tested and comply with performance requirements, details of core and edge construction, trim for openings, and finish.

- B. Shop drawings showing fabrication and installation of polyester faced doors, panels and frames. Include elevations of door design types, details of construction, location and installation requirements of door hardware and reinforcements, and details of openings.
 - 1. Provide schedule of doors indicating sizes, locations, and other pertinent information using same reference numbers for details and openings as those on contract drawings.
- C. Samples for initial selection purposes in form of manufacturer's color charts showing full range of colors available for doors and panels.
- D. Samples for Verification Purposes: Submit 6" square samples of each color of face sheet specified and 12" long sections of aluminum extrusions with specified finish system applied. Where normal color and texture variations are to be expected, include 2 or more units in each set of samples showing limits of such variations.
- E. Qualification Data: For door inspector.
 - 1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1
 - 2. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4
- F. Field test and inspection reports.
- 1.4 QUALITY ASSURANCE
 - A. Single Source Responsibility: Provide doors and frames produced by single manufacturer for entire Project.
 - B. Manufacturer Qualifications: Provide product series that has produced by the manufacturer for at least five years, for similar building type and size as this project.
 - C. Installer's Qualifications: Firm with not less than 4 years successful experience installing systems similar to those required.
 - D. Fire-Rated Door Inspector Qualifications: Inspector for field quality-control inspections of fire-rated door assemblies complies with qualifications set forth in NFPA 80, Section 5.2.3.1
 - E. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies complies with qualifications set forth in NFPA 101, Section 7.2.1.15.4
 - F. Fire Performance Characteristics: Where indicated, provide class "A" fiber reinforced polyester faces with the following surface burning characteristics as determined by testing

identical products per ASTM E 84 by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction.

- 1. Flame Spread: 25 or less.
- 2. Smoke Developed: 450 or less.
- G. Fire-Rated 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 at positive pressure according to NFPA 252 or UL 10C.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver doors cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to surface finishes.
- B. Inspect doors upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.
- D. Identify each door and frame with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Check openings by field measurement before fabrication to ensure proper fitting of work; show measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in work.
- B. Coordinate work of this section with that specified in Section 087100 to ensure proper installation of hardware.

1.7 WARRANTY

A. Product Warranty: Provide manufacturer's standard written warranty agreeing to repair or replace polyester faced doors which fail in materials or workmanship within time period indicated below. Warranty shall included door manufacturer's guarantee that hardware installed by factory will be installed correctly and not come loose within time period indicated below. 1. Warranty period for doors and finish, and hardware installed by factory is ten years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Provide polyester faced doors manufactured by one of following:
 - 1. Special-Lite, Inc.
 - 2. Tubelite, Inc.
 - 3. Commercial Door Systems.

2.2 MATERIALS

- A. Fiberglass Reinforced Polyester Face Material: 0.120" minimum thickness, with color integral through full thickness of face sheet. Provide stained, wood grain textured finish for doors and panels. Face material meeting the following performance criteria:
 - 1. Impact Strength of Face Sheets: ASTM D 256, Izod Impact Strength, 4 foot pounds per inch of notch.
 - 2. Abrasion Resistance of Face Sheets: ASTM D 1242, 25 cycles of Taber Abraser with CH-17 wheel with a 1000 gram load, not to exceed 0.036 percent weight loss.
 - 3. Hardness of Face Sheets: ASTM D 2583, Barcol Meter Hardness Test, not less than 45.
 - 4. Humidity Resistance of Face Sheets: ASTM D 570, water absorption not more than 0.16 percent weight gain after 24-hour immersion.
 - 5. Flammability: Provide Class A rated faces for door faces of interior doors.
- B. Core Material: WSCP-412 proprietary mineral core 1-1/2" thick, 18 pcf minimum density.
- C. Top and Bottom Rails, and Stiles: Tectonite.
- D. Edge Channels: .0.062" thick, 3/4" leg, stainless steel edge channels applied to entire perimeter of the door, sealed by 3M CP 25WB + Fire Barrier caulk applied to the inside edges of all the steel edge channels.
- E. Fasteners: Stainless steel.
- F. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
- 2.3 DOORS
 - A. General: Provide manufacturer's standard fire-rated flush doors as indicated on Drawings.

- 1. Basis of Design Product: Provide Contemporary Wood Grain Fire-Rated Fiberglass Door Model SL-19-1FR by Special Lite, or equivalent.
- 2. Color: Light Maple #5528.
- 3. Door Thickness: 1-7/8"
- 4. Vision Lites: Stainless Steel vison kit with 3/16" NGP Firelite NT glazing, clear.
- 5. Fire Rating: 45 minutes.,

2.4 HARDWARE

- A. Provide gaskets and seals; full-width intumescent and smoke seals at top of door and smoke seals at both jambs.
- B. Remainder of hardware is specified in Section 087100.

2.5 FABRICATION

- A. Factory-prefit and premachine doors for all hardware and to fit frame opening sizes indicated with the following uniform clearances and bevels:
 - 1. Clearances: Not more than 1/8 inch at jambs and heads except between pairs of doors not more than 1/4 inch. Not more than 3/4 inch at bottom.
 - 2. Comply with final hardware schedules and door frame shop drawings and with hardware templates.
 - 3. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.
- B. Complete fabrication, assembly, installation of hardware, finishing and other work before shipment to project site. Disassemble components only as necessary for shipment and installation. Field stick framing is not acceptable.
- C. Factory install vision lites.
- D. Install hinges and all other hardware, with the exception of any surface-applied hardware such as door closer and locksets or push/pull hardware, at the manufacturer's plant.
 - 1. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.
- E. Maintain accurate relation of planes and angles, hairline fit contacting members.
- F. Conceal fasteners where possible provide countersunk flat or oval heads for exposed screws and bolts.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and supports, with the Installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of polyester faced doors. Correct unsatisfactory conditions before proceeding with the installation.
- B. Examine door frames prior to hanging door:
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 - 2. Reject doors with defects.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION
 - A. General: Comply with manufacturer's written instructions for protecting, handling, and installing FRP doors. Do not install damaged components.
 - B. Install doors plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.
 - 1. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.
 - C. Construction Tolerances: Install doors to comply with the following tolerances:
 - 1. Variation from Plane: Do not exceed 1/16 inch in 12 feet of length or 1/8 inch in any total length.
 - 2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch.
 - 3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch.
 - 4. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch.
 - D. Field-apply factory supplied gaskets and seals.
 - E. Drill and tap doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible. Refer to Section 087100 for additional installation requirements.
- 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 according to NFPA 80, Section 5.2.
- 2. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15
- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.
- F. Prepare and submit separate inspection report for each egress door assembly indicating compliance with each item listed in NFPA 101
- 3.4 ADJUSTING, CLEANING AND PROTECTION
 - A. Adjust operating hardware to function properly, for smooth operation without binding, and for weathertight closure.
 - B. Clean complete system, inside and out, promptly after installation, exercising care to avoid damage to coatings.
 - C. Institute protective measures required throughout remainder of construction period to ensure polyester faced doors will be without damage and deterioration, other than normal weathering, at time of acceptance.

END OF SECTION 082250

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall access doors and frames for interior locations.
 - 2. Fire-rated wall access doors and frames for interior locations
 - 3. Ceiling access doors and frames for interior locations.
 - 4. Fire-rated ceiling access doors and frames for interior locations.
 - 5. Fire-rated insulated wall access doors and frames for interior locations.
- B. Locations and Quantities of Access Doors: Not all access doors are shown on the Drawings. It is the intent of this section that access doors be provided wherever access is required for operation and maintenance of concealed equipment, dampers, valves, controls or similar devices.
- C. Cylinders for access doors are specified in Division 08 Section "Door Hardware."
- D. Related Requirements:
 - 1. Division 23 Section "Air Duct Accessories" for heating and air-conditioning duct access doors.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, fire ratings, materials, individual components and profiles, and finishes.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Detail fabrication and installation of access doors and frames for each type of substrate.
- C. Samples: For each door face material, at least 3 by 5 inches (75 by 125 mm) in size, in specified finish.
- D. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

1.3 COORDINATION

A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed equipment, and indicate on schedule specified in "Submittals" Article

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics according to the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.
 - 2. NFPA 288 for fire-rated access door assemblies installed horizontally.

2.2 PRODUCTS, GENERAL

A. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.

2.3 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- 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. Babcock-Davis.
 - 2. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
 - 3. Karp Associates, Inc.
 - 4. Larsen's Manufacturing Company.
 - 5. Milcor Inc.
 - 6. Nystrom, Inc.
- B. Flush Access Doors, with Exposed Trim, for CMU Surfaces: Units consisting of frame with exposed trim, door, hardware, and complying with the following requirements
 - 1. Basis-of-Design Product: Karp Model DSC-214M, Universal Flush Access Door.
 - 2. Assembly Description: Fabricate door to fit flush to frame. Provide flange integral with frame, 3/4 inch (19 mm) wide, overlapping surrounding finished surface.
 - 3. Locations: Provide at non-rated concrete block walls.
 - 4. Uncoated Steel Sheet for Door: Nominal 0.074 inch (1.9 mm), 14 gage.
 - a. Finish: Factory prime.
 - 5. Stainless-Steel Sheet for Door for Toilet Rooms, Shower Rooms, and Other Wet Areas: Nominal 0.074 inch (1.9 mm), 14 gage; No. 4 finish.
 - 6. Frame Material: Nominal 0.060 inch (1.52 mm), 16 gage
 - 7. Hinges: Concealed continuous piano hinge.
 - 8. Latches: Self-latching key-operated bolt type, with interior release; for locking.
- C. Trimless, Flush Access Doors for Gypsum Board Surfaces: Units consisting of frame, concealed edge trim, door, hardware, and complying with the following requirements:

- 1. Basis-of-Design Product: Karp KDW for drywall
- 2. Assembly Description: Fabricate door to fit flush to frame. Provide frame with gypsum board beads for concealed flange installation.
- 3. Locations: Provide at non-rated gypsum board walls and ceilings.
- 4. Uncoated Steel Sheet for Door: Nominal 0.074 inch (1.9 mm), 14 gage.
 - a. Finish: Factory prime.
- 5. Stainless-Steel Sheet for Door for Toilet Rooms, Shower Rooms, and Other Wet Areas: Nominal 0.074 inch (1.9 mm), 14 gage; No. 4 finish.
- 6. Frame Material: Nominal 0.060 inch (1.52 mm), 16 gage.
- 7. Hinges: Concealed continuous piano hinge.
- 8. Latches: Self-latching key-operated bolt type, with interior release; for locking.
- D. Recessed Doors for Acoustical Ceiling Tiles: Units consisting of frame with no exposed trim, recessed door to receive tile, hardware, and complying with the following requirements.
 - 1. Basis-of-Design Product: Karp, Model DSC-210, Recessed Acoustical Ceiling Tile Access Doors.
 - 2. Locations: Provide at non-rated acoustical ceilings tiles.
 - 3. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage thick steel sheet; recessed 1-inch (25.4 mm).
 - a. Finish: Factory prime.
 - 4. Stainless-Steel Sheet for Door for Toilet Rooms, Shower Rooms, and Other Wet Areas: Nominal 0.060 inch (1.52 mm), 16 gage; No. 4 finish.
 - 5. Frame Material: Nominal 0.074 inch (1.9 mm), 14 gage.
 - 6. Hinges: Concealed, pivoting-rod type.
 - 7. Latches: Self-latching key-operated bolt type, with interior release; for locking.
- E. Insulated, Fire-Rated Access Doors for Ceilings and Walls: Units consisting of frame with exposed edge trim, self-latching insulated door, and hardware, and complying with the following requirements:
 - 1. Basis-of-Design Product: Nystrom Model IT Insulated Fire-Rated Access Door, with Exposed Flange, for Walls and Ceilings.
 - Assembly Description: Fabricate door to fit flush to frame, with a core of mineralfiber insulation enclosed in sheet metal. Provide flange integral with frame, 1 inch (25 mm) wide, overlapping surrounding finished surface. Provide self-latching door with automatic closer and interior latch release.
 - 3. Locations: Provide at pipe tunnel and elsewhere as required.
 - 4. Fire-Resistance Ratings:
 - a. Walls: 1-1/2 hours.
 - 5. Uncoated Steel Sheet for Door: 20 ga., 0.0359-inch- (0.91-mm-) thick steel sheet, welded pan type, filled with 2-inch (50 mm) thick fire-rated mineral-fiber insulation.
 - 6. Frame Material: 16 ga., 0.0598-inch- (1.52-mm-) thick steel sheet, 1-inch (25.4 mm) wide exposed trim.
 - 7. Finish: White powder coat.
 - 8. Hinges: Flush continuous piano hinge.

- 9. Hardware: Self-latching key-operated with mortise lock prep, with interior release; for locking.
- F. Hardware:
 - 1. Lock: Cylinder, keyed alike for project
 - 2. Lock for Fire Rated Access Doors: Mortise cylinder.
 - a. Lock Preparation: Prepare door panel to accept cylinder specified in Section 087100 "Door Hardware."

2.4 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- D. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304. Remove tool and die marks and stretch lines or blend into finish.
- E. Frame Anchors: Same type as door face.
- F. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- 2.5 FABRICATION
 - A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
 - B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
 - C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 - 1. For concealed flanges with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
 - 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
 - 3. Provide mounting holes in frames for attachment of units to metal or wood framing.
 - 4. Provide mounting holes in frame for attachment of masonry anchors.

- D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.
- E. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
 - 1. Non-Rated Doors: For cylinder locks, furnish two keys per lock and key all locks alike.
 - 2. Fire-Rated Doors: Cylinder and keys are specified in Section 087100 "Door Hardware."

2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. 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.
- D. Steel and Metallic-Coated-Steel Finishes:
 - 1. Factory Prime: Apply manufacturer's standard, VOC-free, electrostatic-applied powder coat finish immediately after surface preparation and pretreatment.
- E. Stainless-Steel Finishes:
 - 1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
 - 2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - a. Run grain of directional finishes with long dimension of each piece.
 - b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - c. Directional Satin Finish: No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates 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.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
- C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113

SECTION 084113 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior storefront systems.
 - 2. Interior entrance systems including manual-sliding aluminum doors and door frames.
- B. Related sections include the following:
 - 1. Division 07 Section "Joint Sealants" for joint sealants installed as part of aluminum entrance and storefront systems.
 - 2. Division 08 Section "Door Hardware."
 - 3. Division 08 Section "Glazing."

1.2 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.
- B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
 - 1. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
- C. Samples for Verification:
 - 1. Sill profile minimum 6" long.
 - 2. Corner block.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For Installer
 - B. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.
 - C. Warranties: Special warranties specified in this Section.
- 1.4 QUALITY ASSURANCE
 - A. Installer Qualifications: Capable of performing work of this Section and who is acceptable to manufacturer.

- B. Source Limitations: Obtain all entrance and storefront systems and aluminum doors for the entire project through one source and from a single manufacturer.
- C. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code--Aluminum."

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.6 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of entrance and storefront systems that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
 - 1. Warranty Period for Framing: 3 years from date of Substantial Completion.
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Failure of operating components to function normally.
 - Warranty Period for Finishes: 10 years from date of Substantial Completion.
 a. Deterioration of metal finishes beyond normal weathering.
 - 3. Warranty Period for Doors: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide specified products of Kawneer Company, Inc., an Arconic Company or equivalent products by one of the following:
 - 1. EFCO Corporation.
 - 2. YKK AP America Inc.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.

- 1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
- 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221 (ASTM B 221M).
- 3. Extruded Structural Pipe and Tubes: ASTM B 429.
- 4. Bars, Rods, and Wire: ASTM B 211 (ASTM B 211M).
- 5. Welding Rods and Bare Electrodes: AWS A5.10.
- B. Steel Reinforcement: Complying with ASTM A 36 (ASTM A 36M) for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 (ASTM A 570M) for hot-rolled sheet and strip.
- C. Glazing as specified in Division 08 Section "Glazing."
- D. Glazing Gaskets: Manufacturer's standard pressure-glazing system of black, resilient glazing gaskets, setting blocks, and shims or spacers, fabricated from an elastomer of type and in hardness recommended by system and gasket manufacturer to comply with system performance requirements. Provide gasket assemblies that have corners sealed with sealant recommended by gasket manufacturer.
- E. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, nonmigrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.
- F. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
- G. Sealants and joint fillers for joints at perimeter of entrance and storefront systems as specified in Division 07 Section "Joint Sealants."
- H. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.3 COMPONENTS

- A. Interior Storefront and Entrance Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads. Provide outside captured pressure-plate type framing system, center glazed.
 - 1. Thermal-Break Construction: None.
 - 2. Aluminum vertical and horizontal main frame extrusions shall have a minimum wall thickness of .070.
 - 3. Provide entrance framing members compatible with glass framing in appearance
 - 4. Provide heavy wall entrance door frames as required to support sliding doors.
 - 5. Dimensions of Framing Members: Provide framing with vertical and horizontal framing members having a nominal face dimension of 2 inches and overall depth of 6 inches.
 - 6. Finish: Clear anodized.

- 7. Basis of Design Products: Provide Trifab 601 by Kawneer Company, Inc., an Arconic Company or equal products of one of the following:
 - a. EFCO Corp.
 - b. YKK
- B. Doors: Manufacturer's standard sliding mall-front type doors fabricated and designed for interior use.
 - 1. Door Construction: 1-3/8" deep frame, with minimum 0.070-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded.
 - 2. Glazing Stops and Gaskets: Provide manufacturer's standard channel type PVC gasket (Marine glazed).
 - 3. Door Design: As indicated on Drawings.
 - 4. Sill: Provide low profile ADA compliant sill.
 - 5. Finish: Clear anodized.
 - 6. Basis of Design Product: Provide Series 1010 Sliding Mall Front by Kawneer Company, Inc., an Arconic Company or equal products of one of the following:
 - a. EFCO Corp.
 - b. YKK
- C. Brackets and Reinforcements: Provide manufacturer's standard brackets and reinforcements that are compatible with adjacent materials. Provide nonstaining, nonferrous shims for aligning system components.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Reinforce members as required to retain fastener threads.
 - 2. Do not use exposed fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.
 - 3. Provide all required accessories (fasteners, clips, brackets, supports, etc.) required for adjustment and installation as required by field conditions.
- E. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.
- F. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing, compatible with adjacent materials, and of type recommended by manufacturer.
- G. Weather Stripping: Manufacturer's standard replaceable sliding type weather stripping of molded PVC complying with ASTM D 2287 requirements.
- H. Insulating Materials: Provide fiberglass batts for stuffing in openings and cracks.
- 2.4 DOOR HARDWARE

- A. General: Provide hardware units in sizes, number, and type recommended by manufacturer for entrances indicated. Finish exposed parts to match door finish, unless otherwise indicated. All hardware shall be ADA compliant.
- B. Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock sliding storefronts, as follows:
 - 1. One pair of stainless steel tandem rollers per sliding panel
 - 2. Stainless steel roller track
 - 3. Adams Rite MS 1850A-505 Hookbolt Lock
 - 4. Interior and Exterior Cylinders
 - 5. Flush Face Pulls.
- C. Remainder of hardware is specified in Section 087100.

2.5 FABRICATION

- A. General: Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
 - 1. Fabricate components for screw-spline frame construction.
- B. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
- C. Prepare components to receive concealed fasteners and anchor and connection devices.
- D. Fabricate components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.
- E. Welding: Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- F. Glazing Channels: Provide minimum clearances for thickness and type of glass indicated according to GANA's "Glazing Manual."
- G. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- H. Storefront: Fabricate framing in profiles indicated. Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory assemble

components to greatest extent possible. Disassemble components only as necessary for shipment and installation.

- I. Entrances: Fabricate door framing in profiles indicated. Reinforce as required to support imposed loads. Factory assemble door and frame units and factory install hardware to greatest extent possible. Reinforce door and frame units as required for installing hardware indicated. Cut, drill, and tap for factory-installed hardware before finishing components.
 - 1. Provide compression weather stripping at fixed stops. At other locations, provide sliding weather stripping retained in adjustable strip mortised into door edge.
 - 2. Field apply other hardware not supplied with the sliding door and frame assemblies.
- J. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible before shipment to the Project site. Disassemble components only as necessary for shipment and installation.
 - 1. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. Complete these operations for hardware prior to application of finishes.
 - 2. Do not drill and tap for surface-mounted hardware items until time of installation at project site. Refer to Division 08 Section "Door Hardware" for additional hardware installation requirements.
 - 3. Preglaze doors but do not preglaze framing system. Refer to Division 08 Section "Glazing" for specifications.
- K. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish.
 - 1. Welding behind finished surfaces shall be performed in such a manner as to minimize distortion and discoloration on the finished surface.
- L. Reinforcing: Install reinforcing as required for hardware and as necessary for performance requirements, sag resistance and rigidity.
- M. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a nonabsorptive plastic or elastomeric tape, or a gasket between the surfaces. Do not use coatings containing lead.
- N. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members.
- O. Fasteners: Conceal fasteners wherever possible.

2.6 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- D. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

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 entrance and storefront systems. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing entrance and storefront systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.
- B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Division 7 Section "Joint Sealants."
- D. Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.
- E. Install entrances plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.
 - 1. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.

- F. Install glazing to comply with requirements of Division 08 Section "Glazing," unless otherwise indicated.
- G. Install perimeter sealant to comply with requirements of Division 07 Section "Joint Sealants," unless otherwise indicated.
- H. Erection Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances:
 - 1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
 - 2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm). Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).
 - 3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).
- 3.3 ADJUSTING AND CLEANING
 - A. Adjust doors and hardware to provide tight fit at contact points and weather stripping, smooth operation, and weathertight closure.
 - B. Remove excess sealant and glazing compounds, and dirt from surfaces.
- 3.4 PROTECTION
 - A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure entrance and storefront systems are without damage or deterioration at the time of Substantial Completion.
- 3.5 HARDWARE SCHEDULE Refer to Section 087100

END OF SECTION 084113

SECTION 087100 - DOOR HARDWARE

- PART 1 GENERAL
 - 1.01 SUMMARY
 - A. Section includes:
 - 1. Mechanical and electrified door hardware
 - 2. Electronic access control system components
 - 3. Field verification, preparation and modification of existing doors and frames to receive new door hardware.
 - B. Section excludes:
 - 1. Windows
 - 2. Cabinets (casework), including locks in cabinets
 - 3. Signage
 - 4. Toilet accessories
 - 5. Overhead doors
 - C. Related Sections:
 - 1. Division 01 Section "Alternates" for alternates affecting this section.
 - 2. Division 06 Section "Rough Carpentry"
 - 3. Division 06 Section "Finish Carpentry"
 - 4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
 - 5. Division 08 Sections:
 - a. "Metal Doors and Frames"
 - b. "Flush Wood Doors"
 - c. "Stile and Rail Wood Doors"
 - d. "Interior Aluminum Doors and Frames"
 - e. "Aluminum-Framed Entrances and Storefronts"
 - f. "Stainless Steel Doors and Frames"
 - g. "Special Function Doors"
 - h. "Entrances"
 - 6. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.
 - 7. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
 - 8. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

- A. UL Underwriters Laboratories
 - 1. UL 10B Fire Test of Door Assemblies

DOOR HARDWARE

- 2. UL 10C Positive Pressure Test of Fire Door Assemblies
- 3. UL 1784 Air Leakage Tests of Door Assemblies
- 4. UL 305 Panic Hardware
- B. DHI Door and Hardware Institute
 - 1. Sequence and Format for the Hardware Schedule
 - 2. Recommended Locations for Builders Hardware
 - 3. Keying Systems and Nomenclature
 - 4. Installation Guide for Doors and Hardware
- C. NFPA National Fire Protection Association
 - 1. NFPA 70 National Electric Code
 - 2. NFPA 80 2016 Edition Standard for Fire Doors and Other Opening Protectives
 - 3. NFPA 101 Life Safety Code
 - 4. NFPA 105 Smoke and Draft Control Door Assemblies
 - 5. NFPA 252 Fire Tests of Door Assemblies
- D. ANSI American National Standards Institute
 - 1. ANSI A117.1 2017 Edition Accessible and Usable Buildings and Facilities
 - 2. ANSI/BHMA A156.1 A156.29, and ANSI/BHMA A156.31 Standards for Hardware and Specialties
 - 3. ANSI/BHMA A156.28 Recommended Practices for Keying Systems
 - 4. ANSI/WDMA I.S. 1A Interior Architectural Wood Flush Doors
 - 5. ANSI/SDI A250.8 Standard Steel Doors and Frames

1.03 SUBMITTALS

- A. General:
 - 1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
 - 2. Prior to forwarding submittal:
 - a. Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.
 - b. Review drawings and Sections from related trades to verify compatibility with specified hardware.
 - c. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
- B. Action Submittals:
 - 1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
 - 2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:

- 1) Details of interface of electrified door hardware and building safety and security systems.
- 2) Schematic diagram of systems that interface with electrified door hardware.
- 3) Point-to-point wiring.
- 4) Risers.
- 3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
- 4. Door Hardware Schedule:
 - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
 - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
 - c. Indicate complete designations of each item required for each opening, include:
 - 1) Door Index: door number, heading number, and Architect's hardware set number.
 - 2) Quantity, type, style, function, size, and finish of each hardware item.
 - 3) Name and manufacturer of each item.
 - 4) Fastenings and other pertinent information.
 - 5) Location of each hardware set cross-referenced to indications on Drawings.
 - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
 - 7) Mounting locations for hardware.
 - 8) Door and frame sizes and materials.
 - 9) Degree of door swing and handing.
 - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
- 5. Key Schedule:
 - a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
 - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
- C. Informational Submittals:
 - 1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
 - 2. Provide Product Data:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 - b. Include warranties for specified door hardware.
- D. Closeout Submittals:
 - 1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Final approved hardware schedule edited to reflect conditions as installed.
 - d. Final keying schedule
 - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
 - f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
- E. Inspection and Testing:
 - 1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
 - a. fire door assemblies, in compliance with NFPA 80.
 - b. required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

- A. Qualifications and Responsibilities:
 - Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
 - 2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
 - 3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:

- a. For door hardware: DHI certified AHC or DHC.
- b. Can provide installation and technical data to Architect and other related subcontractors.
- c. Can inspect and verify components are in working order upon completion of installation.
- d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
- 4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- B. Certifications:
 - 1. Fire-Rated Door Openings:
 - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
 - b. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
 - 2. Smoke and Draft Control Door Assemblies:
 - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
 - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
 - 3. Electrified Door Hardware
 - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
 - 4. Accessibility Requirements:
 - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.
- C. Pre-Installation Meetings
 - 1. Keying Conference
 - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2) Preliminary key system schematic diagram.
 - 3) Requirements for key control system.
 - 4) Requirements for access control.
 - 5) Address for delivery of keys.

- 2. Pre-installation Conference
 - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Inspect and discuss preparatory work performed by other trades.
 - c. Inspect and discuss electrical roughing-in for electrified door hardware.
 - d. Review sequence of operation for each type of electrified door hardware.
 - e. Review required testing, inspecting, and certifying procedures.
 - f. Review questions or concerns related to proper installation and adjustment of door hardware.
- 3. Electrified Hardware Coordination Conference:
 - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

1.07 WARRANTY

DOOR HARDWARE

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
 - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
 - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
 - a. Mechanical Warranty
 - 1) Locks
 - a) Schlage L Series: 3 years
 - b) Schlage ND Series: 10 years
 - 2) Exit Devices
 - a) Von Duprin: 3 years
 - 3) Closers
 - a) LCN 4000 Series: 30 years
 - b. Electrical Warranty
 - 1) Locks
 - a) Schlage: 1 year
 - 2) Exit Devices
 - a) Von Duprin: 1 year
 - 3) Closers
 - a) LCN: 2 years

1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The Awarding Authority has determined that certain products will be selected for their unique characteristics and particular project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
 - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

- A. Fabrication
 - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
 - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 - 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.
 - 1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
 - 2. Use materials which match materials of adjacent modified areas.
 - 3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.
- C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
 - 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- D. Cable and Connectors:
 - 1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
 - 2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
 - 3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 CONTINUOUS HINGES

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives

- 2. Acceptable Manufacturers:
 - a. Select
 - b. Roton
- B. Requirements:
 - 1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
 - 2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
 - 3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
 - 4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
 - 5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
 - 6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
 - 7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.04 EXIT DEVICES

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Von Duprin 98/35A series
 - 2. Acceptable Manufacturers and Products:
 - a. Precision APEX series
 - b. Falcon 24/25 series
- B. Requirements:
 - 1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
 - 2. Cylinders: Refer to "KEYING" article, herein.
 - 3. Provide smooth touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
 - 4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
 - 5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
 - 6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
 - 7. Provide flush end caps for exit devices.
 - 8. Provide exit devices with manufacturer's approved strikes.

- 9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
- 10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
- 11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
- 12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
- 13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
- 14. Provide electrified options as scheduled.
- 15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
- 16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.05 ELECTRONIC ACCESS CONTROL WIRELESS MORTISE LOCK

- A. Manufacturer and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Schlage LEB Series
 - 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements: Provide wireless electronic locksets that comply with the following requirements.
 - Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1 Operational, Grade 1 Security at locks with non-interchangeable cores, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Cylinders: Refer to "KEYING" article, herein.
 - 2. Provide heavy-duty, handed, field-reversible mortise locks.
 - 3. Backset: 2-3/4-inch (70 mm).
 - 4. Latchbolt: 3/4-inch (19 mm) throw stainless steel latch bolt with anti-friction tongue.
 - 5. Deadbolt: 1" throw stainless steel deadbolt to support Privacy and Apartment functions.
 - 6. Chassis: Provide standard A115.1 preparation for mortise locks for 1-3/4-inch (44 mm) doors.
 - 7. Applicable Standards:
 - a. Listed, UL 294 Standard of Safety for Access Control System Units.
 - b. Compliant with ANSI Standard A156.25 and A156.13 Series 1000, Grade 1 strength and operational requirements.
 - c. Compliant with ANSI/BHMA A156.25 Grade 1 Operation and Security Requirement.
 - d. Certified to UL10C, FCC Part15, IC RSS-210, ADA, RoHS, ICC ANSI A117.1
 - e. Compliant with FBC TAS 201, TAS 202, TAS 203 for door assemblies.
 - f. Certified to FBC 3905, 12400 and 14482
 - 8. Lockset Functions: Provide locks in functions as specified in hardware groups.

- 9. Emergency Override: Provide mechanical key override; cylinders: Refer to "KEYING" article, herein.
- 10. Levers:
 - a. Provide levers operating independently of each other.
 - b. Lever Design: As specified within hardware sets.
- 11. Power Supply:
 - a. Provide lockset powered by four AA batteries
 - b. Provide locksets with the ability to communicate battery status and battery voltage level by means of an application on mobile device, at the door, and remotely by integrated software.
- 12. Features: Provide locksets with the following features.
 - a. Ability to communicate unit's communication status via LED
 - b. Capable of being programmed via Mobile or Web based App to lock via BLE or via integrated SW partner system via BLE Gateway or existing building Wi-Fi
 - c. Visual tri-colored LED indicator that indicate activation, operational systems status, system error conditions and low power conditions as determined by integrated software partner.
 - d. Audible feedback that can be enabled or disabled.
 - e. Tamper-resistant screws: Single tamper-resistant torx screw on inside escutcheon.
 - f. Capable of reacting to a lockdown command in under 5 seconds when used with a software partner that has integrated this feature.
 - g. Suitable for both interior and exterior deployment.
 - h. Employ Wi-Fi communications to permit remote view of audits and alerts, as well as provide automatic daily updates to lock configuration and user access rights.
- 13. Adaptability:
 - a. Open Architecture: Provide locksets manufactured with open architecture characteristics capable of handling new and existing access control software and credential reading technology. Can be supported by cloud-based web and mobile apps without the need for an integrated software partner.
- 14. Switches: Provide locksets with the following built-in switches:
 - a. Door Position Switch
 - b. Interior Cover Tamper Guard
 - c. Request to Exit
 - d. Deadbolt Position where listed in the hardware sets.
 - e. Interior Push Button where listed in the hardware sets.
- 15. Credentials: Provide integral credential reader modules in the following configurations:
 - a. NFC, including peer-peer compatible, operable with both Android and IOS mobile devices
 - b. 125 kHz contactless smart cards
 - 1) Compatibility: Schlage, XceedID, ISONAS, HID, GE/CASI, AWID
 - c. 13.56 MHz contactless smart cards

- 1) Secure section (multi-technology and smart card) compatibility: Schlage MIFARE Classic, Schlage MIFARE DESFire EV1
- 2) 13.56 MHz Serial number only (multi-technology and smart card) compatibility: DESFire CSN, HID iCLASS CSN, MIFARE CSN, MIFARE DESFire EV1 CSN
- d. Multi-technology contactless for applications requiring read capability for both 125 kHz proximity and 13.56 MHz contactless smart cards.
- e. BLE
- 16. Records: Subject to the limitations of the attached access control system, the wireless locks possess enough storage capacity to support 5000 users and 2000 audits.
- 17. Verification time: less than or equal to 1 second for smart cards and proximity cards

2.06 ELECTRONIC ACCESS CONTROL WIRELESS CYLINDRICAL LOCK

- A. Manufacturers:
 - 1. Scheduled Manufacturer and Product:
 - a. Schlage NDEB series
 - 2. Acceptable Manufacturers and Products:
 - a. No substitute
- B. Requirements:
 - 1. ANSI/BHMA A156.2 Series 4000, Grade 1.
 - 2. Florida Building Code (ASTM E330, E1886, E1996) and Miami Dade (TAS 201, 202, 203) requirements for hurricanes.
 - 3. Certified to UL10C 3-hour rating, ULC-S319, FCC Part15, ADA RoHS, ICC ANSI A117.1
 - 4. Listed, UL 294 The Standard of Safety for Access Control System Units.
 - 5. Compliant with ANSI/BHMA A156.25 Operation and Security interior operating range of 32 degrees F (0 degrees C) to 120 degrees F(49 degrees C) for interior use only.
 - 6. Compliant with ASTM E330 for door assemblies.
 - 7. Compliant with ICC / ANSI A117.1, NFPA 101, NFPA 80 and IBC Chapter 10 Cylinders: Refer to "KEYING" article, herein.
 - 8. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
 - a. Abusive Locked Lever Torque Test minimum 3,100 inch-pounds without gaining access
 - b. Offset lever pull minimum 1,600-foot pounds without gaining access
 - c. Vertical lever impact minimum 100 impacts without gaining access
 - d. Cycle Test tested to minimum 16 million cycles with no visible lever sag or use of performance aids such as set screws or spacers.
 - 9. Emergency Override: Provide mechanical key override; cylinders: Refer to "KEYING" article, herein.
 - 10. Levers:

- a. Vandal Resistance: Exterior (secure side) lever rotates freely while door remains locked, preventing damage to internal locking components from vandalism by excessive force.
- b. Provide lever trim that operates independently of each other and is field reversible without tools.
- c. Style: As specified within hardware sets.
- 11. Power Supply: 4 AA batteries
 - a. Provide battery powered wireless electronic products with the ability to communicate battery status and battery voltage level by means of a mobile app at door and remotely by Partner integrated software.
- 12. Features:
 - a. Ability to communicate unit's communication status.
 - b. Visual LED indicators that indicate activation, operational systems status, system error conditions and low power conditions.
 - c. Audible feedback that can be enabled or disabled.
 - d. Suitable for both interior and exterior deployment.
 - e. Employ Wi-Fi communications to permit remote view of audits and alerts, as well as provide automatic daily updates to lock configuration and user access rights.
- 13. Adaptability:
 - a. Open Architecture: Provide locksets manufactured with open architecture characteristics capable of handling new and existing access control software and credential reading technology. Can be supported by cloud-based web and mobile apps without the need for an integrated software partner.
- 14. Switches:
 - a. Door Position Sensor magnet integrated into strike to eliminate additional door prep
 - b. Interior Cover Tamper Guard
 - c. Battery Status
 - d. Request to Exit
 - e. Interior Push Button
- 15. Credentials: Provide integral credential reader modules in the following configurations:
 - a. NFC, including peer-peer compatible, operable with both Android and IOS mobile devices
 - b. 125 kHz contactless smart cards
 - 1) Compatibility: Schlage, XceedID, ISONAS, HID, GE/CASI, AWID
 - c. 13.56 MHz contactless smart cards
 - 1) Secure section (multi-technology and smart card) compatibility: Schlage MIFARE Classic, Schlage MIFARE DESFire EV1
 - 2) 13.56 MHz Serial number only (multi-technology and smart card) compatibility: DESFire CSN, HID iCLASS CSN, MIFARE CSN, MIFARE DESFire EV1 CSN
 - d. Multi-technology contactless for applications requiring read capability for both 125 kHz proximity and 13.56 MHz contactless smart cards.
 - e. BLE

- 16. Records: Subject to the limitations of the attached access control system, the wireless locks possess enough storage capacity to support 5000 users and 2000 audits.
- 17. Verification time: less than or equal to 1 second for smart cards and proximity cards

2.07 OFFLINE CONTROLLER

- A. Manufacturer and Product:
 - 1. Scheduled Manufacturer and Product:
 - a. Schlage CTE Engage Controller
 - 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:
 - 1. Provide an offline single opening controller UL 294 listed and compatible with the Schlage Engage Application. Include a multi-technology reader kit.
 - 2. Provide interfaces for a multi-technology credential reader, powered and dry output relays for strike, alarm, and auxiliary function, and with wireless communication capability.
 - 3. Provide offline controller with the following power options:
 - a. Power Over Ethernet (POE)
 - 1) .5A at 12 VDC for up to 500 feet.
 - 2) 1.5A at 24 VDC for up to 500 feet.
 - b. 12 VDC in 2A at 12 VDC for up to 500 feet.
 - c. 24 VDC in 2A at 24 VDC for up to 500 feet.
 - 4. Provide offline controller with the following communication standards:
 - a. Bluetooth low energy version 4.2.
 - b. 2.4 GHz Wi-Fi (IEEE 802.11b/g/n).
 - c. WPA2, WPA, WEP, 802.1x (PEAP).
 - d. Transport Layer Security (TLS) version 12.
 - e. Advanced Encryption Standard (AES) 256-bit.
 - 5. Provide offline controller with the following signal inputs:
 - a. One Schlage MT11-485 or MT15-485 reader.
 - b. Request to Enter (REN).
 - c. Request to Exit (REX).
 - d. Remote Release hardwired.
 - e. Door Position Switch (DPS).
 - f. Reader tamper (TAMP).
 - 6. Provide offline controller with the following signal outputs:
 - a. Card Reader 0.3A at 12 VDC for up to 500 feet.
 - b. Locking mechanism: 2A at 30 VDC max.

- c. Auxiliary: 2A at 30 VDC max.
- d. Alarm: 2A at 30 VDC max.
- 7. Provide offline controller with the following with operating temperatures between -31 F (-35 C) to 151 F (66 C).
- 8. Provide offline controller with the following on board database:
 - a. up to 5,000 users
 - b. up to 2,000 audits (FIFO)
 - c. up to 16 Time Zones
 - d. up to 32 Holiday Schedules
 - e. up to 16 Schedules (lock & unlock)
- 9. Provide offline controller with the following connectivity options:
 - a. Apple or Droid smart phone Bluetooth updates to CTE.
 - b. Wi-Fi access point automatic daily updates (one time per day) if connected to Wi-Fi.
- C. Provide offline controller with "No-Tour" with MT20W enrollment reader and Schlage 1K smart credentials (13.56 MHz).

2.08 ELECTRIC STRIKES

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Von Duprin 6000 Series
 - 2. Acceptable Manufacturers and Products:
 - a. Folger Adam 300 Series
 - b. HES 1006 Series
- B. Requirements:
 - 1. Provide electric strikes designed for use with type of locks shown at each opening.
 - 2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
 - 3. Where required, provide electric strikes UL Listed for fire doors and frames.
 - 4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.09 PASSIVE INFRARED MOTION SENSORS

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Schlage SCAN II Series
 - 2. Acceptable Manufacturers and Products:

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- a. RCI 915 Series
- b. Securitron XMS Series
- c. Security Door Controls MD-31D Series
- B. Requirements:
 - 1. Provide motion sensors as specified in hardware groups.

2.10 POWER SUPPLIES

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Schlage/Von Duprin PS900 Series
 - 2. Acceptable Manufacturers and Products:
 - a. Precision ELR series
 - b. Sargent 3500 series
- B. Requirements:
 - 1. Provide power supplies approved by manufacturer of supplied electrified hardware.
 - Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
 - 3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
 - 4. Provide power supplies with the following features:
 - a. 12/24 VDC Output, field selectable.
 - b. Class 2 Rated power limited output.
 - c. Universal 120-240 VAC input.
 - d. Low voltage DC, regulated and filtered.
 - e. Polarized connector for distribution boards.
 - f. Fused primary input.
 - g. AC input and DC output monitoring circuit w/LED indicators.
 - h. Cover mounted AC Input indication.
 - i. Tested and certified to meet UL294.
 - j. NEMA 1 enclosure.
 - k. Hinged cover w/lock down screws.
 - I. High voltage protective cover.

2.11 CYLINDERS

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Schlage Everest 29 R

- 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:
 - 1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer's series as indicated. Refer to "KEYING" article, herein.
 - 2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. Conventional Patented Restricted Small Format: cylinder with small format interchangeable cores (SFIC) with restricted, patented keyway.
 - 3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
 - 4. Nickel silver bottom pins.
- 2.12 KEYING
 - A. Scheduled System:
 - 1. Existing factory registered system:
 - a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
 - B. Requirements:
 - 1. Construction Keying:
 - a. Replaceable Construction Cores.
 - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - a) 5 construction control keys
 - b) 10 construction change (day) keys.
 - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
 - 2. Permanent Keying:
 - a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
 - 1) Master Keying system as directed by the Owner.
 - b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
 - c. Provide keys with the following features:
 - 1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
 - 2) Patent Protection: Keys and blanks protected by one or more utility patent(s).

- d. Identification:
 - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
 - 2) Identification stamping provisions must be approved by the Architect and Owner.
 - 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
 - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
 - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
- e. Quantity: Furnish in the following quantities.
 - 1) Change (Day) Keys: 3 per cylinder/core.
 - 2) Permanent Control Keys: 3.
 - 3) Master Keys: 6.

2.13 DOOR CLOSERS

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. LCN 4010/4110 series
 - 2. Acceptable Manufacturers and Products:
 - a. Corbin-Russwin DC8000 series
 - b. Sargent 281 series
- B. Requirements:
 - Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Certify surface mounted mechanical closers to meet fifteen million (15,000,000) full load cycles. ISO 9000 certify closers. Stamp units with date of manufacture code.
 - 2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
 - 3. Cylinder Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter double heat-treated pinion journal.
 - 4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
 - 5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
 - 6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
 - 7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide closers which mount within 6-inch (152 mm) top rail without use of mounting plate so that closer is not visible through vision panel from pull side.
 - 8. Pressure Relief Valve (PRV) Technology: Not permitted.

- 9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI/BHMA Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
- 10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
- 2.14 DOOR TRIM
 - A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Trimco
 - b. Burns
 - B. Requirements:
 - 1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.15 PROTECTION PLATES

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Burns
 - b. Trimco
- B. Requirements:
 - 1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
 - 2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
 - 3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.16 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

- 1. Scheduled Manufacturers:
 - a. Glynn-Johnson
- 2. Acceptable Manufacturers:
 - a. Rixson
 - b. Sargent
 - c. ABH
- B. Requirements:
 - 1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
 - 2. Provide friction type at doors without closer and positive type at doors with closer.

2.17 DOOR STOPS AND HOLDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Trimco
 - b. Burns
- B. Provide door stops at each door leaf:
 - 1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
 - 2. Where a wall stop cannot be used, provide universal floor stops.
 - 3. Where wall or floor stop cannot be used, provide overhead stop.
 - 4. Provide roller bumper where doors open into each other and overhead stop cannot be used.
- 2.18 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING
 - A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Zero International
 - 2. Acceptable Manufacturers:
 - a. National Guard
 - b. Reese

B. Requirements:

- 1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
- 2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
- 3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
- 4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.19 SILENCERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Burns
 - b. Rockwood
 - c. Trimco
- B. Requirements:
 - 1. Provide "push-in" type silencers for hollow metal or wood frames.
 - 2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
 - 3. Omit where gasketing is specified.

2.20 FINISHES

A. Finish of all hardware shall be as specified within hardware sets.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

DOOR HARDWARE

D. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
 - 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
 - 1. Install construction cores to secure building and areas during construction period.
 - 2. Replace construction cores with permanent cores as indicated in keying section.
 - 3. Furnish permanent cores to Owner for installation.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.
 - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 - 5. Connections to panel interface modules, controllers, and gateways.
 - 6. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

DOOR HARDWARE

Abbreviation	Name
GLY	Glynn-Johnson Corp
IVE	H.B. Ives
LCN	Lcn Commercial Division
SCE	Schlage Electronic Security
SCH	Schlage Lock Company
VON	Von Duprin
ZER	Zero International Inc

66024 OPT0244629 Version 1 Hardware Group No. 01 Provide each SGL door(s) with the following:

TTOVIGE		OL (001(3) with the following.			
QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	WIRELESS ELECTRONIC LOCK	NDEBHD ATH BATTERY OPERATED	606	SCE
1	EA	SFIC EVEREST CORE	80-037 CKC EV29 R	606	SCH
1	EA	NOTE	BALANCE OF HARDWARE EXISTING		

NOTE:

1. REMOVE EXISTING LOCK AND REPLACE WITH NEW ACCESS CONTROL LOCK. 2. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING DOOR/FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO DOOR/FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL.

Hardware Group No. 01.1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	313AN	IVE
1	EA	WIRELESS ELECTRONIC	NDEBHD ATH BATTERY OPERATED	606	SCE
1	EA	SFIC EVEREST CORE	80-037 CKC EV29 R	606	SCH
1	EA	SURFACE CLOSER	4011	696	LCN
1	EA	KICK PLATE	8400 8" B-CS	606	IVE
1	EA	NOTE	BALANCE OF HARDWARE EXISTING		

NOTE:

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL. Hardware Group No. 01.3

Provide each SGL door(s) with the following:

• •	ovide	cuon o	O = door(0) with the following.			
	QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
	1	EA	CONT. HINGE	112XY	313AN	IVE
	1	EA	WIRELESS ELECTRONIC	NDEBHD ATH BATTERY OPERATED	606	SCE
	1	EA	SFIC EVEREST CORE	80-037 CKC EV29 R	606	SCH
	1	EA	OH STOP	90S	606	GLY
	1	EA	SURFACE CLOSER	4011	696	LCN
	1	EA	MOUNTING PLATE	4010-18 SRT	US4	LCN
	1	EA	KICK PLATE	8400 8" B-CS	606	IVE
	1	EA	NOTE	BALANCE OF HARDWARE EXISTING		

NOTE:

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL.

Hardware Group No. 01A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	WIRELESS ELECTRONIC	NDEBHD ATH BATTERY	606	SCE
		LOCK	OPERATED		
1	EA	SFIC EVEREST CORE	80-037 CKC EV29 R	606	SCH
1	EA	NOTE	BALANCE OF HARDWARE		
			EXISTING		

NOTE:

1. REMOVE EXISTING LOCK AND REPLACE WITH NEW ACCESS CONTROL LOCK. 2. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING DOOR/FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO DOOR/FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL. Hardware Group No. 02

Provide each SGL door(s) with the following:

101100	04011 0				
QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STOREROOM MORT LOCK	LEBMS-ADDHD-07 BATTERY	606	SCE
		W/LED INDICATOR	OPERATED		
1	EA	SFIC EVEREST CORE	80-037 CKC EV29 R	606	SCH
1	EA	NOTE	BALANCE OF HARDWARE		
			EXISTING		

NOTE:

1. REMOVE EXISTING LOCK AND REPLACE WITH NEW ACCESS CONTROL LOCK. 2. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING DOOR/FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO DOOR/FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL.

Hardware Group No. 03

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	WIRE HARNESS	CON-6W (WIRE LEADS FOR CONNECTION TO POWER)		SCH
1	EA	CONTROLLER	CTE-MTB15-485-B	В	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE
1	EA	POWER SUPPLY	PS902 KL900 120/240 VAC	LGR	SCE
1	EA	NOTE	BALANCE OF HARDWARE EXISTING		

NOTE:

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING DOOR/FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO DOOR/FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL. Hardware Group No. 03.1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	313AN	IVE
1	EA	FIRE EXIT HARDWARE	98-L-NL-F-07	630	VON
1	EA	SFIC RIM CYLINDER	80-159	606	SCH
1	EA	SFIC EVEREST CORE	80-037 CKC EV29 R	606	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4111 EDA	696	LCN
1	EA	KICK PLATE	8400 8" B-CS	606	IVE
1	EA	WIRE HARNESS	CON-6W (WIRE LEADS FOR CONNECTION TO POWER)		SCH
1	EA	CONTROLLER	CTE-MTB15-485-B	В	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE
1	EA	POWER SUPPLY	PS902 KL900 120/240 VAC	LGR	SCE
1	EA	NOTE	BALANCE OF HARDWARE EXISTING		

NOTE:

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL.

Hardware Group No. 03A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	WIRE HARNESS	CON-6W (WIRE LEADS FOR CONNECTION TO POWER)		SCH
1	EA	CONTROLLER	CTE-MTB15-485-B	В	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE
1	EA	POWER SUPPLY	PS902 KL900 120/240 VAC	LGR	SCE
1	EA	NOTE	BALANCE OF HARDWARE EXISTING		

NOTE:

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING DOOR/FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO DOOR/FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL. Hardware Group No. 03B

		p No. 05D					
Provide each PR door(s) with the following:							
QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR	
1	EA	REMOVABLE MULLION	KR4854 STAB		695	VON	
1	EA	SFIC MORTISE CYL.	80-132		606	SCH	
1	EA	SFIC EVEREST CORE	80-037 CKC EV29 R		606	SCH	
1	EA	ELECTRIC STRIKE	6111 FSE DSLC CON 12/24 VAC/VDC		630	VON	
1	EA	WIRE HARNESS	CON-6W (WIRE LEADS FOR CONNECTION TO POWER)			SCH	
1	EA	CONTROLLER	CTE-MTB15-485-B		В	SCE	
1	EA	MOTION SENSOR	SCANII 12/24 VDC		BLK	SCE	
1	EA	POWER SUPPLY	PS902 KL900 120/240 VAC		LGR	SCE	
1	EA	NOTE	BALANCE OF HARDWARE EXISTING				

NOTE:

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING DOOR/FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO DOOR/FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL. Hardware Group No. 03C

Provide each PR door(s) with the following:							
	DESCRIPTION	CATALOG NUMBER		FINISH	MFR		
EA	CONT. HINGE	112XY TWP CON		313AN	IVE		
EA	ELEC FIRE EXIT HARDWARE	RX-LC-9827-L-F-LBRAFL-M996- 07-499F-FSE		606	VON		
EA	ELEC FIRE EXIT HARDWARE	RX-LC-9827-L-NL-F-LBR-07-499F		606	VON		
EA	SFIC RIM CYLINDER	80-159		606	SCH		
EA	SFIC EVEREST CORE	80-037 CKC EV29 R		606	SCH		
EA	SURFACE CLOSER	4111 EDA		696	LCN		
EA	KICK PLATE	8400 8" B-CS		606	IVE		
EA	WIRE HARNESS	CON-LENGTH TO SUIT (CONNECT POWER TRANSFER TO ELECTRIFIED LOCKING DEVICE)			SCH		
EA	WIRE HARNESS	CON-6W (WIRE LEADS FOR CONNECTION TO POWER)			SCH		
EA	CONTROLLER	CTE-MTB15-485-B		В	SCE		
EA	POWER SUPPLY	PS902 KL900 120/240 VAC		LGR	SCE		
EA	NOTE	BALANCE OF HARDWARE EXISTING					
	EA EA EA EA EA EA EA EA EA EA EA	each PR door(s) with the following: DESCRIPTIONEACONT. HINGEEAELEC FIRE EXIT HARDWAREEAELEC FIRE EXIT HARDWAREEASFIC RIM CYLINDEREASFIC EVEREST COREEASURFACE CLOSEREAKICK PLATEEAWIRE HARNESSEACONTROLLEREAPOWER SUPPLY	each PR door(s) with the following: DESCRIPTIONCATALOG NUMBEREACONT. HINGE112XY TWP CONEAELEC FIRE EXIT HARDWARERX-LC-9827-L-F-LBRAFL-M996- 07-499F-FSEEAELEC FIRE EXIT HARDWARERX-LC-9827-L-NL-F-LBR-07-499FEAELEC FIRE EXIT HARDWARERX-LC-9827-L-NL-F-LBR-07-499FEASFIC RIM CYLINDER HARDWARE80-159EASFIC EVEREST CORE SURFACE CLOSER80-037 CKC EV29 REASURFACE CLOSER VIRE HARNESS4111 EDAEAKICK PLATE CON-LENGTH TO SUIT (CONNECT POWER TRANSFER TO ELECTRIFIED LOCKING DEVICE)EAWIRE HARNESSCON-6W (WIRE LEADS FOR CONNECTION TO POWER)EACONTROLLER EACTE-MTB15-485-BEAPOWER SUPPLY PS902 KL900 120/240 VAC BALANCE OF HARDWARE	each PR door(s) with the following:CATALOG NUMBEREACONT. HINGE112XY TWP CONEEAELEC FIRE EXITRX-LC-9827-L-F-LBRAFL-M996- 07-499F-FSEEEAELEC FIRE EXITRX-LC-9827-L-NL-F-LBRAFL-M996- 07-499F-FSEEEAELEC FIRE EXITRX-LC-9827-L-NL-F-LBR-07-499FEEAELEC FIRE EXITRX-LC-9827-L-NL-F-LBR-07-499FEEASFIC RIM CYLINDER80-159EEASFIC EVEREST CORE80-037 CKC EV29 REEASURFACE CLOSER4111 EDAEEASURFACE CLOSER4111 EDAEEAWIRE HARNESSCON-LENGTH TO SUIT (CONNECT POWER TRANSFER TO ELECTRIFIED LOCKING DEVICE)EEAWIRE HARNESSCON-6W (WIRE LEADS FOR CONNECTION TO POWER)EEACONTROLLERCTE-MTB15-485-BEEAPOWER SUPPLYPS902 KL900 120/240 VACEEANOTEBALANCE OF HARDWAREE	e each PR door(s) with the following: DESCRIPTIONCATALOG NUMBERFINISHEACONT. HINGE112XY TWP CON313ANEAELEC FIRE EXIT HARDWARERX-LC-9827-L-F-LBRAFL-M996- 07-499F-FSE606EAELEC FIRE EXIT HARDWARERX-LC-9827-L-NL-F-LBR-07-499F606EAELEC FIRE EXIT HARDWARERX-LC-9827-L-NL-F-LBR-07-499F606EASFIC RIM CYLINDER HARDWARE80-159606EASFIC EVEREST CORE VEREST CORE80-037 CKC EV29 R606EASURFACE CLOSER 4111 EDA696EASURFACE CLOSER 4111 EDA696EAWIRE HARNESSCON-LENGTH TO SUIT (CONNECT POWER TRANSFER TO ELECTRIFIED LOCKING DEVICE)606EAWIRE HARNESSCON-6W (WIRE LEADS FOR CONNECTION TO POWER)8EAPOWER SUPPLYPS902 KL900 120/240 VAC8EAPOWER SUPPLYPS902 KL900 120/240 VAC8EANOTEBALANCE OF HARDWAREIGR		

NOTE:

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL.

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Hardwa	are Grou	ир No. 03D		
Provide	e each F	PR door(s) with the following:		
QTY		DESCRIPTION	CATALOG NUMBER	FINISH
2	EA	CONT. HINGE	112XY	313AN
1	EA	REMOVABLE MULLION	KR4854 STAB	695
2	EA	PANIC HARDWARE	LD-98-EO	606
1	EA	SFIC MORTISE CYL.	80-132	606
2	EA	SFIC RIM CYLINDER	80-159	606
3	EA	SFIC EVEREST CORE	80-037 CKC EV29 R	606
1	EA	ELECTRIC STRIKE	6111 FSE DSLC CON 12/24	630
			VAC/VDC	
2	EA	DOOR PULL	VR910 NL	630
2	EA	SURFACE CLOSER	4111 SCUSH	696
2	EA	KICK PLATE	8400 8" B-CS	606
2	EA	DOOR SWEEP	8197D	D
1	EA	WIRE HARNESS	CON-6W	
			(WIRE LEADS FOR	
			CONNECTION TO POWER)	
1	EA	CONTROLLER	CTE-MTB15-485-B	В
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK
1	EA	POWER SUPPLY	PS902 KL900 120/240 VAC	LGR

NOTE:

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NOTE

1. CONTRACTOR TO FILL/PATCH ANY OLD HARDWARE PREPARATIONS IN EXISTING FRAME THAT WILL NO LONGER BE USED WITH NEW HARDWARE. CONTRACTOR IS RESPONSIBLE FOR ANY MODIFICATIONS TO FRAME AS REQUIRED TO MOUNT NEW DOOR HARDWARE, INCLUDING MORTISES, REINFORCEMENTS AND ALL PREPARATION OF THE EXISTING MATERIAL.

EXISTING

BALANCE OF HARDWARE

HARDWARE TO REMAIN

		up No. AA			
Provide	each F	PR door(s) with the following:			
QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1		NOTE	HARDWARE BY DOOR		
			MANUFACTURER		
	-				
		up No. EX-PR			
Provide	each F	PR door(s) with the following:			
QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE	EXISTING DOOR/FRAME AND		

END OF SECTION

Door Numbers	HwSet#
104	01
108	01
108J	01
109A	01
110A	01
111B	01A
111F	01A
112	01
113	01
114	01
114B	01A
118	EX-PR
120	03A
122	02
128	01
141	01
150	01
151	01
152	01
153	01
163	01A
164	01
168	01
169	01
201	01
202	01
202A	01
203A	01
203B	01
204	01
205	01
206	01
208	01.3
209	01.3
210	01
211	01
212	01.3
226J	03A
226K	03B
250	01
252	01
252	01
263	03C
263A	01
263B	03

Door Numbers	HwSet#	
263C	03.1	
263G	01	
264	01	
266	01	
302	01.3	
303	01	
303B	01.3	
304A	01.3	
308	01.3	
309	01.3	
310	01.3	
311	01.3	
312	01.3	
313	01.3	
314	01.1	
317	01	
318	01	
350	01	
351	01	
352	01	
353	01	
C167	03D	
C182	03	
CA-1	03C	
CA-2	03.1	
KT-1	AA	
KT-2	01.3	
ST6-1	03A	
ST7-1	03A	
ST-1-10	EX-PR	
ST-22	03.1	
SV-1	03A	
SV-5A	01.3	
V-2	03A	
V-3C	03A	

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Doors.
 - 2. Interior borrowed lites, sidelights and transoms.
 - 3. Glazed entrances.
 - 4. Storefront framing.
 - 5. Glazed decorative metal railing systems
 - 6. Interior glazed partitions.

1.2 DEFINITIONS

- A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
- B. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Where glass thicknesses are indicated these are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Where glass thickness is not indicated design glass thickness and types of glass required by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 - 1. Glazed Decorative Metal Railing System: Design glass to withstand loads as specified in Section 055313.

1.4 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass and of 12-inch- (300-mm-) long Samples for sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
 - 1. Each type of laminated glass specified.
 - 2. Each type of fire-rated glass specified.
- C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
 - 1. Glazing sealants.
 - 2. Fire resistive glazing
- F. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of glass from one primary-glass manufacturer.
- C. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.
 - 1. Glass Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- D. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.

- 1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
- 2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
- E. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 252.
- F. Glazing for Fire-Rated Window Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 257.
- G. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
 - 1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
 - 2. Safety glass includes fully tempered glass, laminated glass and fire-resistant glass.
- H. Fire-Rated Glass: Permanently mark fire-rated glass with certification label of certification agency acceptable to authorities having jurisdiction indicating manufacturer name, test standard and fire-rating.
- I. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines."
 - 2. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
- J. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- 1.7 PROJECT CONDITIONS
 - A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers

and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F (4.4 deg C).

1.8 WARRANTY

- A. General Warranty: 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. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Fire Rated Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRIMARY FLOAT GLASS

- A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); Class 1 unless otherwise indicated in schedules at the end of Part 3.
 - Ultra-Clear (Low-Iron) Float Glass: Class I (clear); with a minimum 91 percent visible light transmission and a minimum solar heat gain coefficient of 0.87.
 a. Product: Vitro Architectural Glass; Starphire Ultra-Clear, or equal

2.2 HEAT-TREATED FLOAT GLASS

- A. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
- A. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.
 - 1. Ultra-Clear (Low-Iron) Float Glass: Class I (clear); with a minimum 91 percent visible light transmission and a minimum solar heat gain coefficient of 0.87.

a. Product: Vitro Architectural Glass; Starphire Ultra-Clear, or equal.

2.3 FIRE RATED GLAZING

- A. Fire-Rated Glazing Product (Laminated Ceramic Glazing Material): Proprietary Category I and II safety glazing product in the form of 2 lites of clear ceramic glazing material laminated together to produce a laminated lite of 5/16-inch nominal thickness; polished on both surfaces, weighing 4 lb/sq. ft.; and as follows:
 - 1. Fire-Protection Rating: As indicated for the assembly in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Polished on both surfaces, transparent.
 - 3. Product: "FireLite Plus Premium" by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.

2.4 LAMINATED GLASS

- A. Laminated Glass: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified, including those in the Laminated-Glass Schedule at the end of Part 3.
- B. Interlayer: Interlayer material as indicated below, clear or in colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.
 - 1. Interlayer Material: Polyvinyl butyral sheets
 - 2. Interlayer Thickness: .030".
 - 3. Interlayer Color: Clear; except for glass balusters of decorative metal railing system provide frosted interlayer in pattern selected by Architect.
- C. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows:
 - 1. Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.

2.5 ELASTOMERIC GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
 - 1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

- 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.
- 4. Field-applied sealants shall have a VOC content of not more than 250 g/L.
- B. Single-Component Neutral-Curing Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 50; Uses NT, M, G, A, and, as applicable to joint substrates indicated, O.
 - 1. Products:
 - a. Dow Corning Corporation; 791.
 - b. Dow Corning Corporation; 795.
 - c. GE Silicones; SilPruf NB SCS9000.
 - d. GE Silicones; UltraPruf II SCS2900.
 - e. Pecora Corporation; 865.
 - f. Pecora Corporation; 895.
 - g. Pecora Corporation; 898
- C. Glazing Sealants for Fire-Resistive and Fire Protective Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.

2.6 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
- B. Expanded Cellular Glazing Tape: Closed-cell, PVC foam tape; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
 - 1. Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.
- C. Glazing Tapes for Fire-Resistive and Fire Protective Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.

2.7 GLAZING GASKETS

A. Glazing gaskets for storefront and entrance systems are specified in Division 08 Section "Aluminum-Framed Storefronts and Entrances".

2.8 GLASS ACCESSORIES

A. Counter/Partition Posts: 12" high glass partition and divider posts designed to accept $\frac{1}{4}$ " thick glass, fabricated from 1-1/2" square brushed stainless steel tube with full length U-channels for glazing. Provide end posts and center posts as required, flat top caps, welded flange base and all other components for complete installation.

1. Basis of Design Product: CRL Plaza Series Model PP43CBS by CR Laurence Co., or equal.

2.9 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Silicone elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. 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.
- 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.
- G. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating
- 2.10 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS
 - A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
 - B. Grind smooth and polish exposed glass edges.

PART 3 - EXECUTION

- 3.1 EXAMINATION
 - A. Examine framing glazing, 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 system.
 - 3. Minimum required face or edge clearances.

- 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- 3.3 GLAZING, GENERAL
 - A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
 - B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
 - C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
 - D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
 - E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
 - F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
 - G. Provide spacers for glass lites where the length plus width is larger than 50 inches (1270 mm) as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
 - H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

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. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. 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. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
 - B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
 - C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight

seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

- D. Install gaskets so they protrude past face of glazing stops.
- 3.6 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 PROTECTION AND CLEANING
 - A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
 - B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
 - C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
 - D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
 - E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.8 GLASS SCHEDULE

- A. Interior Glazing, as Scheduled:
 - 1. Non-Fire Rated Doors, Transoms, Sidelights and Borrowed Lights: 1/4 inch clear tempered glass.

- 2. Fire Rated Doors, Transoms, Sidelights and Borrowed Lights: Laminated ceramic glazing material 5/16 inches thick; "FireLite Plus Premium" by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.
- 3. Aluminum Storefront and Entrance Framing: 1/4 inch clear tempered glass.
- 4. Sliding Aluminum and Glass Doors: 1/4 inch clear tempered glass.
- 5. Counter Partition: 1/4 inch clear tempered glass.
- 6. Glazing for Glazed Decorative Metal Railing System: ½ inch laminated glass fabricated from two lites of clear low-iron, heat strengthened glass with frosted interlayer in pattern as selected by Architect.
 - a. Low-Iron Glass: Starphire Ultra-Clear by Vitro Architectural Glass

END OF SECTION 088000

SECTION 092116.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes: Gypsum board shaft wall assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each component of gypsum board shaft wall assembly.

1.3 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.

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or with gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, 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.
- B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E 90 and classified according to ASTM E 413 by a testing and inspecting agency.

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

- A. Fire-Resistance Rating: 1 hour and 2 hours as indicated.
- B. STC Rating: As indicated.
- C. Studs: Manufacturer's standard profile for repetitive members, corner and end members, and fire-resistance-rated assembly indicated.
 - 1. Depth: 2-1/2 inches (64 mm), 4 inches (102 mm) and 6 inches (152 mm) as indicated on the Partition Type Drawing.
 - 2. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
- D. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches (51 mm) long and matching studs in depth.
 - 1. Minimum Base-Metal Thickness: Matching steel studs.
- E. Room-Side Finish: As indicated.
- F. Shaft-Side Finish: Gypsum shaftliner board, moisture- and mold-resistant Type X.
- G. Insulation: Sound attenuation blankets.
- 2.3 PANEL PRODUCTS
 - A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
 - B. Gypsum Shaftliner Board, Type X: ASTM C 1396/C 1396M; manufacturer's proprietary fire-resistive liner panels with paper faces.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Lafarge North America, Inc.; Firecheck Type X Shaftliner.
 - b. National Gypsum Company; Gold Bond Brand Fire-Shield Shaftliner.
 - c. USG Corporation; Sheetrock Brand Gypsum Liner Panel.
 - d. American Gypsum; Shaft Liner.
 - 2. Thickness: 1 inch (25.4 mm).
 - 3. Long Edges: Double bevel.
 - C. Gypsum Shaftliner Board, Moisture- and Mold-Resistant Type X: ASTM C 1396/C 1396M; manufacturer's proprietary fire-resistive liner panels with moisture- and mold-resistant core and surfaces.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Lafarge North America, Inc.; Firecheck Moldcheck Type X Shaftliner.
 - b. National Gypsum Company; Gold Bond Brand Fire-Shield Shaftliner XP.
 - c. USG Corporation; Sheetrock Brand Mold Tough Gypsum Liner Panel.
 - 2. Thickness: 1 inch (25.4 mm).
 - 3. Long Edges: Double bevel.
 - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

D. Gypsum Board: As specified in Section 092900 "Gypsum Board."

2.4 NON-LOAD-BEARING STEEL FRAMING

- A. Steel Framing Members: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 1. Protective Coating: ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized unless otherwise indicated.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with manufacturer's written recommendations.
- B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Section 092900 "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written recommendations 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 capability to sustain, without failure, a load equal to 5 times design load, as determined by testing according to ASTM E 488 conducted by a qualified testing agency.
 - 2. 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 according to ASTM E 1190 conducted by a qualified testing agency.
- E. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from slag wool, or rock wool; Provide mineral-fiber SAFB.
- F. Acoustical Sealant: As specified in Section 079200 "Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board shaft wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance.

- 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.

3.2 PREPARATION

- A. Sprayed Fire-Resistive Materials: Coordinate with gypsum board shaft wall assemblies so both elements of Work remain complete and undamaged. Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft wall assemblies to comply with requirements specified in Section 078100 "Applied Fireproofing."
- B. After sprayed fire-resistive materials are applied, remove only to extent necessary for installation of gypsum board shaft wall assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLATION

- A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and ASTM C 754 other than stud-spacing requirements.
- B. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.
 - 1. Reinforcing: Where handrails directly attach to gypsum board shaft wall assemblies, provide galvanized steel reinforcing strip with 0.033-inch (0.84-mm) minimum thickness of base metal (uncoated), accurately positioned and secured behind at least one layer of face panel.
- D. 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, elevator call buttons, elevator floor indicators, and similar items.
- E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.
- F. 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.
 - 1. Install control joints on 30 foot maximum centers, for all partitions, at locations indicated, and as detailed. Align control joints with door frames wherever

possible, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

- G. Sound-Rated Shaft Wall Assemblies: 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.
- H. Cant Panels: At projections into shaft exceeding 4 inches (102 mm), install 1/2- or 5/8inch- (13- or 16-mm-) thick gypsum board cants covering tops of projections.
 - 1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches (610 mm) o.c. with screws fastened to shaft wall framing.
 - 2. Where steel framing is required to support gypsum board cants, install framing at 24 inches (610 mm) o.c. and extend studs from the projection to shaft wall framing.
- I. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.4 IDENTIFICATION

- A. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:
 - 1. Be located in accessible concealed floor, floor-ceiling or attic spaces.
 - 2. Be repeated at intervals not exceeding 30 feet (914 mm) measured horizontally along the wall or partition.
 - 3. Include lettering not less than 0.5 inch (12.7 mm)) in height, incorporating the followings wording: "FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS," or other wording to reflect the wall type as indicated on the Code Summary Drawings.

3.5 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 092116.23

SECTION 092150 - GYPSUM PLASTER REPAIR AND RESTORATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Repair of existing plaster on interior walls and ceilings to the extent indicated on drawings.
 - 2. Repair of existing plaster on interior walls and ceilings that requires cutting or removal to accommodate new conduit, piping, or other components of mechanical and electrical systems or other new construction.

1.2 SUBMITTALS

- A. Product Data consisting of manufacturer's product specifications and installation instructions for each product, including data showing compliance with specified requirements.
- B. Samples for verification in units at least 12 inches (300 mm) square of each type of finish indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
- C. Material Certificates: Submit certificate signed by manufacturer for each kind of plaster aggregate certifying that materials comply with requirements.

1.3 QUALITY ASSURANCE

- A. Installer: A firm having not less than five (5) years successful experience in plaster work similar to work of this project.
- B. Workmen: Skilled plasterers who have demonstrated experience in the type of work specified and who are thoroughly familiar with the requirements of the work. In acceptance or rejection of plaster work, no allowance will be made for lack of skill on the part of the workmen.
- C. Single-Source Responsibility: Obtain gypsum plaster from one source and by a single manufacturer.
- D. Fire-Test-Response Characteristics: Where fire-resistance-rated plaster assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance

Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

- E. Mockups: Prior to proceeding with plaster repair and restoration work, prepare mock-up panels for each type of finish and application required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
 - 1. Provide in-place 2' x 2' (min. size) sample of each type of repair work at existing plaster wall or ceiling surfaces to demonstrate quality of work expected in finished work in location directed by Architect.
 - 2. Execute mock-up in presence of Architect using all materials indicated for final Work including lath, support system, and control joints.
 - 3. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.
 - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 5. Obtain Architect's approval of mockups before proceeding with remainder of plaster repair and restoration work.
 - 6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed plasterwork.
 - 7. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.
- B. Store materials inside, under cover, and dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes. Protect plaster material from dampness and intrusion of foreign material.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.
- B. Temperature Requirements: Maintain continuous uniform room temperature of not less than 40 deg F (4 deg C) nor more than 80 deg F (27 deg C) for at least 7 days before beginning plaster application, during its application, and until plaster is dry but for at least 7 days after application is complete. Distribute heat evenly; prevent concentrated or uneven heat from contacting plaster near heat source.
- C. Ventilation Requirements: Ventilate building spaces as required to remove water in excess of that required for hydrating plaster. Begin ventilation immediately after plaster is applied and continue until it sets.

D. Protect contiguous work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Gypsum Plasters and Accessories:
 - a. National Gypsum Co.
 - b. United States Gypsum Co.

2.2 LATH

- A. Expanded-Metal Lath: Fabricate expanded-metal lath from uncoated or zinc-coated (galvanized) steel sheet to produce lath complying with ASTM C 847 for type, configuration, and other characteristics indicated below, with uncoated steel sheet coated after fabrication into lath.
 - 1. Diamond-Mesh Lath: Weighing 3.4 lb/sq. yd. (1.8 kg/sq. m).
 - a. Provide self-furring type for plastering directly on masonry, concrete, plywood and other flat surfaces.
 - b. Provide rib lath for ceiling locations.
 - c. Provide expanded metal flat diamond mesh lath for all other locations.

2.3 ACCESSORIES

- A. General: Comply with material provisions of ASTM C 841 and the requirements indicated below; coordinate depth of accessories with thicknesses and number of plaster coats required.
 - 1. Galvanized Steel Components: Fabricated from zinc-coated (galvanized) steel sheet complying with ASTM A 653, G40 (ASTM A 653M, Z90) minimum coating designation.
- B. Metal Cornerbeads: Type as indicated below, fabricated from zinc-coated (galvanized) steel.
 - 1. Type: Small nose with perforated flanges, for use on curved corners.
 - 2. Type: Small nose with expanded flanges reinforced by perforated stiffening rib, for use on columns and for finishing masonry corners.
 - 3. Type: Bull nose, radius 3/4 inch (19 mm) minimum, with expanded flanges, at locations indicated.

- C. Strip Reinforcement: Smooth-edge strips of expanded-metal lath fabricated from uncoated or zinc-coated (galvanized) steel sheet, with uncoated steel sheet coated after fabrication; in the following forms:
 - 1. Cornerite: Strips bent lengthwise in center for internal plaster angles not otherwise reinforced by metal lath lapped or carried around.
 - 2. Stripite: Flat strips for reinforcing joints in gypsum lath, nonmetallic bases, and between dissimilar plaster bases.
- D. Casing Beads: Square-edged style, with short or expanded flanges to suit kinds of plaster bases indicated; of the following material:
 - 1. Material: Zinc-coated (galvanized) steel.
- E. Control Joints: Prefabricated, zinc-coated (galvanized) steel; one-piece type with folded pair of nonperforated screeds in M-shaped configuration, with expanded or perforated flanges.
 - 1. Provide removable protective tape on plaster face of control joints.
- 2.4 MISCELLANEOUS MATERIALS
 - A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
 - B. Bonding Compound: ASTM C 631.
 - C. Repair and Reinforcing Tape: Open-mesh, glass fiber.
- 2.5 PLASTER MATERIALS
 - A. Base-Coat Plasters: ASTM C 28, types as indicated below:
 - 1. High-strength gypsum neat plaster with a minimum, average, dry compressive strength of 2800 psi (19 MPa) per ASTM C 472 for a mix of 100 lb (45 kg) of plaster and 2 cu. ft. (0.06 cu. m) of sand.
 - B. Finish-Coat Plasters: Gypsum Keene's cement, ASTM C 61.
 - C. Finishing Hydrated Limes: ASTM C 206, type S, special hydrated lime for finishing purposes.
 - D. Aggregates for Base-Coat Plasters: ASTM C 35, type as indicated below:
 - 1. Sand aggregate, unless otherwise indicated.
 - E. Aggregates for Finish-Coat Plaster with Floated Finish: ASTM C 35, sand aggregate. graded per ASTM C 842.

- F. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. High-Strength Gypsum Neat Plaster:
 - a. Structo-Base; United States Gypsum Co.
 - 2. Gypsum Keene's Cement:
 - a. Red Top Keene's Cement; United States Gypsum Co.
 - 3. Finishing Hydrated Limes, Type S:
 - a. Ivory Finish Lime; United States Gypsum Co.
 - b. Snowdrift Finish Lime; United States Gypsum Co.
- 2.6 PLASTER MIXES AND COMPOSITIONS
 - A. Plaster Base-Coat Compositions: Comply with ASTM C 842 and manufacturer's written instructions for plaster base-coat proportions that correspond to application methods and plaster bases indicated below:
 - 1. Three-Coat Work over Masonry and Metal Lath: Base coats as indicated below:
 - a. Scratch Coat: High-strength gypsum plaster with job-mixed sand.
 - b. Brown Coat: High-strength gypsum plaster with job-mixed sand.
 - B. Finish Coats: Proportion materials in parts by dry weight for finish coats to comply with the following requirements for each type of finish coat and texture indicated:
 - 1. Troweled Finishes: Finish-coat proportion as indicated below:
 - a. Gypsum Keene's Cement: 2 parts plaster to 1 part lime.
- 2.7 MIXING
 - A. Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.
 - B. Use materials without admixture of materials other than those specified herein in each instance. No retempering or retarding of partially set plaster mixes will be permitted, trade custom or local practices notwithstanding.
 - C. Mix plaster in a batch type mixer at the construction site. Frozen, caked or lumpy material shall not be used. Clean mixer of all set or hardened material before materials for a new batch are loaded.
 - D. Mix each batch of plaster separately. Thoroughly mix to obtain uniformity of color and workable consistency of mass and only in such quantities as will be used before it has started to set. Retempering after the plaster has started to set will not be permitted and such plaster shall be discarded.

- E. Machine mix special finishing hydrated lime with amount of water called for in printed directions of the manufacturer to form a putty and allow to stand for at least 15 minutes before using. Treat hydrated lime in a manner to obtain smooth or lump-free putty. Protect the putty from sun and take preventive measures to prevent excessive evaporation while stored.
- F. Batches for base coats shall not be in excess of an amount that can be entirely used within two hours. Batches for finish coats shall not be in excess of an amount that can be entirely used within 30 minutes.

PART 3 - EXECUTION

- 3.1 INSPECTION
 - A. Examine surfaces to which the work is to be attached or applied and notify Architect of existing conditions that are detrimental to the proper and expeditious installation of the work. Starting of work shall imply acceptance of surfaces to perform work as specified.
- 3.2 PROTECTION
 - A. Exercise care to avoid soiling or spattering plaster onto the work of other trades. Use cover cloths or other suitable means of protection.
 - B. Cover and protect furniture, equipment and fixtures to remain from soiling or damage when plaster repair work is performed in areas from which such items have not been removed.
 - C. Take precautions to prevent unnecessary staining and smearing of floors by covering the floors with polyethylene.
- 3.3 PLASTER REMOVAL:
 - A. Remove deteriorated plaster and corroded metal lath in areas indicated on drawings. Carefully remove all existing plaster that is loose, friable, bubbled, crumbling or otherwise deteriorated or unsuitable to remain. Make clean, sharp edges beveled inward to insure firm bond of new plaster.
- 3.4 INSTALLATION OF LATH AND FURRING, GENERAL
 - A. Interior Lathing and Furring: Install materials indicated for plaster to comply with ASTM C 841.
 - B. Isolation: Where lathing and metal support system abuts building structure horizontally and where partition or wall abuts overhead structure, sufficiently isolate from structural movement to prevent transfer of loading from building structure. Install slip- or cushion-type joints to absorb deflections but maintain lateral support.

1. Frame both sides of control joints independently and do not bridge joints with furring and lathing or accessories.

3.5 METAL LATHING

A. Install expanded-metal lath for applications where plaster base coats are required. Provide appropriate type, configuration, and weight of metal lath selected from materials indicated that comply with referenced lathing installation standards.

3.6 INSTALLATION OF PLASTERING ACCESSORIES

- A. General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and in alignment during plastering.
- B. Accessories: Provide the following types to comply with requirements indicated for location:
 - 1. Cornerbeads: Install at external corners.
 - 2. Casing Beads: Install at terminations of plaster work, except where plaster passes behind and is concealed by other work and where metal screeds, bases, or frames act as casing beads.
 - 3. Control Joints: Install at locations indicated or, if not indicated, at spacings and locations required by referenced standard, recommended by plaster manufacturer, and approved by Architect. Spacing between joints in either direction shall not exceed the following:
 - a. Partitions: 30 feet (9 m).
- 3.7 PLASTER APPLICATION, GENERAL
 - A. Prepare monolithic surfaces for bonded base coats and use bonding compound to comply with requirements of referenced plaster application standards for conditioning monolithic surfaces.
 - B. Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet (3 mm in 3 m) from a true plane in finished plaster surfaces, as measured by a 10-foot (3-m) straightedge placed at any location on surface.
 - C. Grout hollow-metal frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, before lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout at least 6 inches (152 mm) at each jamb anchor.
 - D. Sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.
 - E. Plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated. Where plaster is not terminated at metal

frame by casing beads, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.

- F. Apply thicknesses and number of coats of plaster as indicated or as required by referenced standards.
- G. Concealed Plaster: Where plaster application will be concealed by wood paneling, above suspended ceilings and in similar locations, finish coat may be omitted; where concealed behind cabinets, similar furnishings, and equipment, apply finish coat; where used as a base for adhesive application of tile and similar finishes, omit finish coat, coordinate thickness with overall dimension as shown, and comply with tolerances specified.

3.8 PLASTER APPLICATION

- A. Plaster Application Standard: Apply plaster materials, composition, mixes, and finishes indicated to comply with ASTM C 842.
- B. Execute work to provide a finish free from depressions, bulges, slick spots, scratches, brush and tool marks, cracks, visible joints, crazing, and discolorations. Surfaces shall have true planes, with uniform texture to match the adjoining surfaces and with lines and arises that are straight, plumb and level. Work shall be true to grounds and guidelines and free from blemishes and defects of any sort.
 - 1. Ventilation: During the application of each coat of interior plaster, keep the exterior openings closed until the plaster has set, then adjust for proper ventilation to regulate the drying and curing of the plaster.
 - 2. Thickness of Plaster: Match original thickness where patching.
 - a. Where plastering over existing walls in which existing surface is uneven and bumpy, adjust plaster thickness as much as possible to compensate for existing surface irregularities.
 - 3. Joints: Lap joints in succeeding coats including joints at interior angles; continue past the angle and corner and feather off on adjacent wall.
- C. Scratch (First) Coat:
 - 1. Apply plaster with sufficient materials and pressure to force plaster to form good bond with solid base material and cover well.
 - 2. Leave surface level.
 - 3. Scratch this coat and allow to set and thoroughly dry out before the application of the brown coat.
- D. Brown (Second) Coat:
 - 1. Do not apply brown coat until after scratch coat has hardened, not sooner than 48 hours after application of scratch coat. Evenly dampen scratch coat to provide uniform suction before brown coat is applied.

- 2. Prior to application of gypsum brown coat place plaster screeds at angles and corners and at intervals of 8' in both walls and ceilings unless grounds occur at smaller intervals.
- 3. Thickness of Brown Coat: Approximately 3/8". Bring brown coat out to ground and required lines, to true, even surfaces. Straighten with rod and darby and leave rough to accept finish coat.
- 4. Moist cure brown coat for 48 hours after application and then allow coat to set and dry out.
- E. Finish Coat:
 - 1. Thickness of Finish: 1/16 to 1/8 inch thick and treated and finished as directed.
 - 2. Before application of finish coat, cut out shrinkage cracks and fill with scratch coat mortar.
 - 3. Apply finish coats well ground to scratched surfaces, then double back and trowel down to a true plane, filling all imperfections. Delay troweling as long as possible and used only to eliminate uneven points and to force aggregate particles into the plaster surface. Avoid excessive troweling.
 - a. For smooth coat finish, trowel surface to a smooth, highly polished surface.
 - 4. Finish surfaces plumb, straight, level, and true throughout, varying from a true plane by not more than 1/8" when tested with a 10' straightedge at any point and finish surface to match adjacent existing texture.
- F. Washdown: When plaster work has been completed, wash down the new plaster with a zinc sulphate solution (2 pounds per gallon of water) and allow to dry.

3.9 CUTTING AND PATCHING

- A. Cut, patch, replace, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.
- B. Leave plaster ready for painting.

3.10 PATCHING AND REPAIRS TO EXISTING PLASTER

- A. General: Provide patching and repairs to existing plasterwork that is damaged or deteriorated or has been disturbed to accommodate installation of new mechanical or electrical equipment or other construction. Make all such repairs and prepare all surfaces as required to obtain a complete and first class job, as required by job conditions. Comply with plaster manufacturer's recommendations for preparation of surfaces, including installation of lath.
- B. Preparation: Scrape and sand existing plaster surfaces to be repaired, removing all loose and peeling paint.

- C. Bonding Compound on Existing Plaster Surfaces: Apply bonding agent to existing plaster to receive new repair material and allow to dry until no longer tacky before proceeding.
- D. Apply plaster, filling repaired areas in accordance with general plastering provisions described herein. Repair cracks, spalls, gaps and holes, restoring surfaces to a smooth, true, and flush condition.
- E. Reinforce interior angles and flat joints with joint tape and embedding material to comply with ASTM C 843 and manufacturer's written recommendations.
- F. Bumps and Wavy Surfaces: Thoroughly sand bumps and waves as much as possible and apply skim coats of plaster compound filling all depressions to obtain a smooth and true surface. Contractor may use spackling compound that is compatible for use over plaster if approved in advance by the Architect.
- G. Fill hairline cracks with plaster flush and smooth. All other cracks shall have a channel cut along full length of crack of sufficient width to attain tight bond and to receive new plaster. Reverse cut side walls of channel to insure proper bonding of new plaster. Fill channel with successive coats specified herein bringing finish coat out flush for invisible appearance.
- H. Skim coat plaster where base is sound but surface is cracked or crazed or surface was not originally an acceptable finish coat or where for other reasons surface is not hard, smooth, acceptable finish for scheduled surface treatment.
- I. Do not apply plaster coat over any existing painted surfaces.
- J. Execute pointing around fixtures, outlet boxes, switches, plates, piping, registers, and all other elements abutting or extending through plaster.
- K. Repaired and patched areas shall match adjoining work in texture and finish.
- 3.11 CLEANING AND PROTECTING
 - A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering. When plastering is completed, remove unused materials, containers, and equipment and clean floors of plaster debris.
 - B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure plaster work is without damage or deterioration at the time of Substantial Completion.
- 3.12 CURING
 - A. Allow plaster to cure 30 days prior to application of paint or other finishes.

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END OF SECTION 092150

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product.

PART 2 - PRODUCTS

- 2.1 DESCRIPTION
 - 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.
 - B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- 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 (Z120), hot-dip galvanized, unless otherwise indicated.
 - B. Studs and Runners: ASTM C 645.
 - 1. Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: 0.0296 inch, 20 ga. (0.752 mm).
 - b. Depth: As scheduled on Drawings for each location.
 - C. Slip-Type Head Joints: Provide one of the following:
 - 1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs

friction fit into top runner and with continuous cold rolled channel bridging attached to each stud located within 12 inches (305 mm) of the top of studs to provide lateral bracing.

- 2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch-(51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
- 3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) ClarkDietrich; MaxTrak Slotted Deflection Track
 - 2) Steel Network Inc. (The); VertiClip SLD Series.
 - 3) Telling Industries; True-Action[™] Slotted Track.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 0.033 inch, 20 ga. (0.84 mm).
- E. Cold-Rolled Channel Bridging and Bracing: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 1-1/2 inches (38 mm) unless otherwise indicated.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch-(1.72-mm-) thick, galvanized steel.
- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.018 inch (0.45 mm).
 - 2. Depth: 7/8 inch (22.2 mm) unless otherwise indicated.
- G. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
 - 1. Configuration: Asymmetrical.
- H. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 3/4 inch (19 mm) unless otherwise indicated.
 - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch (0.8 mm).
 - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-(1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.
 - a. Type: Postinstalled, chemical anchor or postinstalled, expansion anchor.
 - 2. Powder-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 (4.12 mm) in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch (25 by 5 mm) by length indicated.
- E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch (1.34 mm) and minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 1-1/2 inches (38 mm) unless otherwise indicated on Drawings.
- F. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
 - 2. Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.018 inch, 25 ga. (0.45 mm).
 - b. Depth: As indicated on Drawings.
 - 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22 mm) deep. a. Minimum Base-Metal Thickness: 0.018 inch (0.45 mm).
 - 4. Resilient Furring Channels: 1/2-inch- (13-mm-) deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- G. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 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.; Drywall Grid Systems.
- b. Chicago Metallic Corporation; Drywall Grid System.
- c. USG Corporation; Drywall Suspension System.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal 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, 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 (3.2 mm) 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 hollowmetal 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.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
 - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches (610 mm) o.c.
 - 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce

thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

- 3.3 INSTALLATION, GENERAL
 - A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
 - B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
 - C. Install bracing at terminations in assemblies.
 - D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
 - E. Cutting, Notching and Boring Holes in Nonstructural Steel Wall Framing:
 - 1. Flanges and lips of nonstructural steel wall studs shall not be cut or notched.
 - 2. Holes in webs of nonstructural steel wall studs shall be permitted along the centerline of the web of the framing member, shall not exceed 1-1/2 inches (38 mm) in width or 4 inches (102 mm) in length, and the holes shall not be spaced less than 24 inches (610 mm) center to center from another hole or less than 10 inches (254 mm) from the bearing end.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- B. Install studs so flanges within framing system point in same direction.
 - 1. Space studs at 16 inches (406 mm) o.c. unless otherwise indicated.
- C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.

- b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
- c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
- 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistancerated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
- 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- 6. Curved Partitions:
 - a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 - b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches (150 mm) o.c.
- D. Install steel studs used as furring with clip angles at midpoint of wall span. Install additional clips to limit deflection to L/240 for walls finished with gypsum wall board and L/360 for walls finished with tile or plaster when subject to 5 psf (239 Pa) lateral load.
- E. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.
- 3.5 INSTALLING SUSPENSION SYSTEMS
 - A. Install suspension system components in sizes and spacings indicated on Drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
 - B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
 - C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

- 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
- 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
- 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
- 5. Do not attach hangers to steel roof deck.
- 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
- 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
- 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092800 - GLASS-REINFORCED GYPSUM FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following preformed products for interior use, fabricated in glass reinforced gypsum:
 - 1. Column covers.
- B. Related Work include the following:
 - 1. Framing and furring for items requiring anchorage are specified in Division 05 Section "Metal Fabrications."
 - 2. Blocking, nailers, and shims for items requiring anchorage are specified in Division 06 Section "Miscellaneous Carpentry."
 - 3. Finishing of column covers is specified in Division 09 Section "Ceramic Tile."

1.2 SYSTEM PERFORMANCE REQUIREMENTS

- A. Fabricate and install glass-reinforced gypsum units to withstand, without failure or cracking, loads from gravity and structural movement, including thermally induced movement, and to resist other conditions of in-service use that the building will experience.
- 1.3 ACTION SUBMITTALS
 - A. Product data for each type of product specified.
 - B. Shop drawings showing thickness, finish, ornamentation, tolerances, and anchorage details. Indicate attachment methods, imbedded supports, reinforcement, fabrication, joint treatments, and supports.
 - C. Samples for verifying glass-reinforced gypsum units. Show the full range of variations in detail expected.
 - 1. Glass-Reinforced Gypsum Units: 2-foot- (0.50-m-) long section with finished joint, typical of the units specified.
- 1.4 INFORMATIONAL SUBMITTALS

- A. Installer certificates signed by manufacturer certifying that Installers comply with requirements under "Quality Assurance" Article.
- B. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed glassreinforced gypsum installations similar in material, design, and extent to that indicated for this Project and with a construction record of successful in-service performance.
- B. Manufacturer Qualifications: Manufacturer must be able to show that he has at least 5 years experience in this type of work, has experienced personnel, physical facilities, established quality control procedures and management capacity sufficient to produce the required parts without causing delay of the project.
- C. Single Source Responsibility for Glass-Reinforced Gypsum Materials: Obtain glassreinforced gypsum fabrications from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide glass-reinforced gypsum units with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Flame Spread: 25 or less.
 - 2. Smoke Developed: 450 or less.
- E. Mockups: Prior to installing glass-reinforced gypsum units, construct mockups for each form of construction and finish required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
 - 1. Locate mockups on site in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 3. Apply specified tile finish to column covers.
 - 4. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

- 5. Accepted mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.
- F. Engineering Responsibility: Engineer glass-reinforced gypsum units by qualified professional engineer legally authorized to practice in the jurisdiction where Project is located.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver glass-reinforced gypsum units in factory-wrapped crates, packaged to keep units dry and free of moisture.
 - B. Store glass-reinforced gypsum units at Project site to prevent cracking, distortion, warping, staining, or other physical damage.
 - C. Comply with manufacturer's recommendations for storing and handling units.
- 1.7 PROJECT CONDITIONS
 - A. Field Measurements: Verify dimensions by field measurements before fabricating glassreinforced gypsum units and show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - B. Space Enclosure and Environmental Limitations: Do not install glass-reinforced gypsum units until space is enclosed and weatherproof, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.
 - 1. Acclimatize glass-reinforced gypsum units by removing packaging and storing in the installation space not less than 48 hours before installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by Castle Access Panels and Forms Inc. or equal products of one of the following:
 - 1. Decoform Corporation
 - 2. Casting Designs, Inc.
 - 3. GRG Technologies
 - 4. Plastrglas.

2.2 MATERIALS

- A. Gypsum Material: Provide alpha-based, calcined gypsum produced from materials complying with ASTM C 22.
- B. Glass Fibers: Comply with ASTM D 578 "E" glass type chopped into 1 inch lengths.
- C. Glass-Reinforced Gypsum Units: Glass fiber shall be 5 to 6 percent by weight of gypsum and glass mixture. Provide units identical to those tested for the following performance characteristics, per test method indicated below, by testing and inspecting organizations acceptable to authorities having jurisdiction.
 - 1. Hardness: 95 RH min Rockwell Scale.
 - 2. Modulus of Rupture 3200 3500 psi when tested in accordance with ASTM C 109.
 - 3. Modulus of Elasticity: 2.7 3.8 x 106 psi when tested in accordance with ASTM C 109.
 - 4. Coefficient of Linear Thermal Expansion: 8 x 10-6 inch/inch/deg F when tested in accordance with ASTM D 696.
- D. Material Compatibility: Provide GFRG products with surface characteristics prepared for mortar attachment of ceramic tile.
- 2.3 MISCELLANEOUS MATERIALS
 - A. Embedded or Inserted Hardware: Complying with ASTM A 641, and integrated into the members without visibility on the finish face.
 - B. Fasteners: Self-tapping gypsum wallboard screws.
 - C. Adhesives: As recommended in manufacturer's printed instructions. and meeting VOC requirements of jurisdiction.
 - D. Sealants: Refer to Section 079200 for sealant materials.
- 2.4 FABRICATION
 - A. Basis of Design Product: GFRG Column Covers by Castle Access Panels & Forms, Inc. or equal.
 - 1. Shape: Round
 - 2. Diameter: As indicated on Drawings
 - 3. Column Base: Recessed.
 - 4. Column Top: Straight, no capital.
 - 5. Shaft: Straight

- 6. Shell Thickness: Minimum 1/4", and minimum $\frac{1}{2}$ " at edges.
- 7. Appearance: Seamless.
- B. Fabricate units as large as possible to minimize joints.
- C. Fabricate units with smooth finished surfaces, prepared to accept application of ceramic tile finish. Repair hollows, voids, scratches, and finish surface imperfections.
- D. Dimensional Tolerances of Units: As follows:
 - 1. Warpage or Bowing: Plus or minus 1/16 inch.
 - 2. Dimensional, all Directions: Plus or minus 1/8 inch.
 - 3. Plane Surface Straightness: Plus or minus 1/8 inch.
 - 4. Overall Assembled Length and Width: Plus or minus 1/8 inch per 10 feet.
 - 5. Out of Round: Plus or minus 1/16 inch.
- E. Construct molds for column cover units of materials resulting in smooth, finished products conforming to profiles and dimensions indicated.
- F. Combine glass fiber and matrix slurry at rates to achieve desired mix proportions and glass content, and sprayed in accordance with manufacturer's instructions.
- G. Embed indicated or required inserts in matrix to develop full strengths. Embed items after required minimum body thickness have been achieved.
- H. Form columns to dimensions indicated. Tolerance as specified. Curved panels accurately formed to radii. Fabricate column covers in two sections with vertical butt joint, suitable for field finishing.
- I. Carefully remove units from molds and repair hollows, voids, scratches and other surface imperfections. Surface shall be primer ready.
- J. Factory fabricate accessories and trim components, hardware, including attachment devices, ready for installation.
- K. Provide base and ceiling joints as indicated, or if not indicated, as per manufacturer's standard detail.
- 2.5 FINISH
 - A. Column cover panels shall be free of scratches and blemishes; column covers to be field finished as specified in Division 09 Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates areas and conditions with Installer present for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of glass-reinforced gypsum units. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install glass-reinforced gypsum units plumb, level, true, and aligned with adjacent materials. Use concealed shims where required for alignment.
- B. Erection Tolerances: As follows:
 - 1. Plane Alignment (Panel to Panel): 1/16 inch (1.6 mm).
 - 2. Variation from Plumb: Plus or minus 1/8 inch (3.2 mm) per 10 feet (3 m).
 - 3. Variation from Straightness: Plus or minus 1/4 inch (6.3 mm) per 25 feet (7.6 m).
 - 4. Assembly Deflection: Not greater than the length of the assembly divided by 240.
 - 5. Joint Alignment: Not more than 1/8 inch (3.2 mm).
 - 6. Joint Width: Not more than 3/8 inch (9.5 mm).
- C. Predrill fastener holes in ornamentation. Clean fastener holes, removing dirt and oil.
- D. Screw fasteners in place by hand. Do not use pneumatic staple guns. Countersink flathead screws.
- E. Fasten as required to comply with dimensional tolerances and not less than 5/16 inch (7.9 mm) from edge and end.
- F. Patch fastener holes with bedding compound and fiberglass tape applied flush with finish face. Sand patch smooth and level.
- G. Attach pieces at joints with adhesive, and band or brace together until adhesive is cured. Cure adhesive according to manufacturer's printed instructions.
- H. Joint Finishing: Comply with ASTM C 840. Provide smooth and contiguous surface.

END OF SECTION 092800

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Cement board.
 - 3. Sound-attenuation blankets
- B. Related Requirements:
 - 1. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.
 - 2. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for metal shaft-wall framing, gypsum shaft liners, and other components of shaft-wall assemblies.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.3 QUALITY ASSURANCE

- A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Install mockups for the following:
 - a. Each level of gypsum board finish indicated for use in exposed locations.
 - 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
 - 3. Simulate finished lighting conditions for review of mockups.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 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.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 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.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CertainTeed Corp.
 - 2. Georgia-Pacific Gypsum LLC.
 - 3. Lafarge North America Inc.
 - 4. National Gypsum Company.
 - 5. USG Corporation.
 - B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch (15.9 mm).
 - 2. Long Edges: Tapered.

- 3. Where drawings indicate regular type 5/8 inch (15.9 mm), provide 5/8 inch (15.9 mm) Type X
- C. Flexible Gypsum Board: ASTM C 1396/C 1396M. Manufactured to bend to fit radii and to be more flexible than standard regular-type gypsum board of same thickness.
 - 1. Thickness: 1/4 inch (6.4 mm).
 - a. Long Edges: Tapered
- 2.4 SPECIALTY GYPSUM BOARD
 - A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.
 - 1. Products: Subject to compliance with requirements, provide one of the following or equal:
 - a. CertainTeed Corp.; ProRoc Type C.
 - b. Lafarge North America Inc.; Firecheck Type C.
 - c. National Gypsum Company; Gold Bond Fire-Shield C.
 - d. USG Corporation; Firecode C Core.
 - 2. Thickness: 5/8 inch (15.9 mm), unless otherwise indicated.
 - 3. Long Edges: Tapered.
 - 4. Provide where required by UL Design or NER 258.
- 2.5 TILE BACKING PANELS
 - A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corp.; FiberCement BackerBoard.
 - b. Custom Building Products; Wonderboard.
 - c. James Hardie Building Products, Inc.; Hardiebacker 500.
 - d. National Gypsum Company, Permabase Cement Board.
 - e. USG Corporation; DUROCK Cement Board.
 - 2. Thickness: 1/2 inch (12.7 mm) or 5/8 inch (15.9 mm) as indicated.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- 2.6 TRIM ACCESSORIES
 - A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized-coated steel sheet or rolled zinc
 - 2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. Expansion (control) joint.
 - f. Curved-Edge Cornerbead: With notched or flexible flanges.
 - B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.
 - c. Pittcon Industries.
- 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
- 3. Finish:
 - a. Curved Drywall Trim: Corrosion-resistant primer compatible with joint compound and finish materials specified.
- 4. Basis of Design Products:
 - a. Curved Drywall Trim: Provide Contura curved drywall trim by Gordon Inc. for locations indicated on the Drawings, in sizes required.

2.7 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Tile Backing Panels: As recommended by panel manufacturer.
- 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, beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use factory mixed drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use factory mixed drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.
- D. Joint Compound for Tile Backing Panels:
 - 1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.8 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

- 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 - 1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Provide mineral-fiber SAFB where required by the UL assembly.
- E. Acoustical Joint Sealant: As specified in Section 079200 "Joint Sealants"

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 APPLYING AND FINISHING PANELS, GENERAL
 - A. Comply with ASTM C 840.
 - B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
 - C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) 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. (0.7 sq. m) 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- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) 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. STC-Rated 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 C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
 - 1. Refer to Section 079200 for additional requirements.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: Vertical surfaces unless otherwise indicated.
 - 2. Ceiling Type: Ceiling surfaces.
 - 3. Type C: Where required for specific fire-resistance-rated assembly indicated.
 - 4. Flexible Type: Apply in double layer at curved assemblies.
- 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.
- C. Multilayer Application:
 - 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
 - 2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - 3. Fastening Methods: Fasten base layers and face layers separately to supports with screws.
- A. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- B. Curved Surfaces:
 - 1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch- (300-mm-) long straight sections at ends of curves and tangent to them.
 - 2. For double-layer construction, fasten base layer to studs with screws 16 inches (400 mm) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches (300 mm) o.c
- 3.4 APPLYING TILE BACKING PANELS
 - A. Cementitious Backer Units: ANSI A108.11, at showers, tubs, and where indicated.
 - B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.
- 3.5 INSTALLING TRIM ACCESSORIES
 - A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
 - B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
 - 1. Install control joints on 30 foot maximum centers, for all partitions, at locations indicated, and as detailed. Align control joints with door frames wherever

possible, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

- 2. Install control joints at 50 foot maximum centers, with areas not to exceed 2,500 sq. ft. for all ceiling areas, at locations indicated, and as detailed.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners unless otherwise indicated.
 - 2. Bullnose Bead: Use where indicated.
 - 3. LC-Bead: Use at exposed panel edges.
 - 4. L-Bead: Use where indicated.
 - 5. Curved-Edge Cornerbead: Use at curved openings.
- D. Aluminum Trim: Install in locations indicated on Drawings.
- 3.6 FINISHING GYPSUM BOARD
 - A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
 - B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
 - C. Apply joint tape over gypsum board joints, except 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 C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 4: At all panel surfaces that will be exposed to view unless otherwise indicated.
 - 4. Level 5: Provide Level 5 finish at all areas where wall washed lighting is indicated and at surfaces scheduled to receive gloss paint, and elsewhere specifically indicated on Drawings and schedules.
 - E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 IDENTIFICATION

- A. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:
 - 1. Be located in accessible concealed floor, floor-ceiling or attic spaces.
 - 2. Be repeated at intervals not exceeding 30 feet (914 mm) measured horizontally along the wall or partition.
 - 3. Include lettering not less than 0.5 inch (12.7 mm)) in height, incorporating the followings wording: "FIRE AND/OR SMOKE BARRIER—PROTECT ALL

OPENINGS," or other wording to reflect the wall type as indicated on the Code Summary Drawings.

3.8 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair 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 092900

SECTION 093100 - CERAMIC TILING

- PART 1 GENERAL
- 1.1 SUMMARY
 - A. This Section includes the following:
 - 1. Porcelain tile
 - 2. Ceramic tile
 - 3. Trim and edge accessories.
 - B. Sealing of expansion, contraction, control, and isolation joints in tile surfaces is specified in Division 07 Section "Joint Sealant."
- 1.2 ACTION SUBMITTALS
 - A. Product data for each type of product specified.
 - B. Samples of each color of tile or accessory to be provided, for verification purposes.
 - C. Samples of grout demonstrating full range of colors available, for initial selection purposes.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, plus other information specified.
- 1.4 QUALITY ASSURANCE
 - A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
 - B. Single-Source Responsibility for Setting and Grouting Materials: Obtain ingredients of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.
 - C. Installer Qualifications: Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.
 - D. Unit Mock-up: Provide mock-up on a board min. 2' x 2' in size, one for each different tile and grout color to be provided in the work; for final approval of grout color before ordering grout.

- E. In-Place Mock-up: Prepare mock-ups of types indicated below following requirements of this section. Reprepare mock-ups as many times as required by Architect until satisfactory result is obtained, as judged solely by Architect. Obtain Architect's approval of visual qualities before proceeding with work. Protect approved mock-ups until all work has been completed. Approved mock-ups will represent the minimum standard of acceptability for each portion of the work.
 - 1. Provide in-place sample minimum 5' x 5' of typical wall tile layout in location directed by Architect.
 - 2. Provide mock-up of mosaic tile installed on one GFRG column as specified in Section 092800.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.
 - B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.
- 1.6 PROJECT CONDITIONS
 - A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
 - B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.
 - C. Maintain temperatures at 50 deg F (10 deg C) or more in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.7 EXTRA MATERIALS

A. Extra Materials: Furnished from same production run as ceramic tile installed. Furnish 10% of each type and color of tile material provided in the work. Package materials with protective covering and identify with labels describing contents. Deliver extra materials to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturers: The design for each tile type and other material specified is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the following manufacturers:

- 1. Tile:
 - a. American Olean; Div. of Dal-Tile International Corp
 - b. Creative Materials Corp.
 - c. Crossville Inc
 - d. Daltile; Div. of Dal-Tile International Inc.
 - e. Garden State Tile
 - f. Olympia Tile
 - g. Florida Tile Industries, Inc.
 - h. Summitville Tiles, Inc.
 - i. United States Ceramic Tile Company
- 2. Mortars and Grouts:
 - a. Bostik Construction Products Div. (Hydroment)
 - b. Laticrete International Inc.
 - c. Mapei Corp.
 - d. TEC Specialty Construction Brands Inc.
- 3. Termination, Trim and Transition Strips: Schluter
- 2.2 PRODUCTS, GENERAL
 - A. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated.
 - 1. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
 - B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with products and materials indicated for setting and grouting.
 - C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 - 1. Match color, texture, and pattern indicated by reference to manufacturer's standard designations for these characteristics.
 - D. Factory Blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.
 - E. Large Format Tiles: Large format tiles are defined to be tiles with any one single side larger than 15".
- 2.3 TILE PRODUCTS
 - A. Porcelain Wall Tile T1: Provide flat tile complying with the following requirements:

- 1. Module Size: 12" x 24" rectified
- 2. Thickness: 8 mm
- 3. Finish: Polished
- 4. Color(s): Grey #11
- 5. Basis of Design Product: Creative Materials Corp. "Bellissimo" or equal.
- 6. Location: Cafeteria half-wall
- 7. Pattern: Running bond 1/3 overlap.
- 8. Grout Color: Laticrete #90 Light Pewter and/or #78 Sterling Silver as determined during mock-up preparation.
- B. Porcelain Mosaic Wall Tile T 2: Provide flat tile complying with the following requirements:
 - 1. Module Size: 1 by 1 inches
 - 2. Sheet Size: 12" x 12"
 - 3. Nominal Thickness: 3/16 inch.
 - 4. Mount Type: Mesh mounted.
 - 5. Shape: Penny rounds
 - 6. Finish: Gloss
 - 7. Color(s): 055 Stable
 - 8. Basis of Design Product: American Olean "Mosaic Penny Rounds" or equal.
 - 9. Location: Cafeteria columns.
 - 10. Grout Color: Laticrete #90 Light Pewter and/or #78 Sterling Silver as determined during mock-up preparation.
- C. Porcelain Wall Tile T3: Provide flat tile complying with the following requirements:
 - 1. Module Size: 12" x 24" cut to 6" h x 24"w
 - 2. Thickness: 8 mm
 - 3. Finish: Polished
 - 4. Color(s): Grey #13
 - 5. Basis of Design Product: Creative Materials Corp. "Bellissimo" or equal.
 - 6. Location: Wall base in Cafeteria
 - 7. Grout Color: Laticrete #60 Dusty Grey.
- D. Ceramic Wall Tile T4: Provide flat tile complying with the following requirements:
 - 1. Module Size: 6" x 18"
 - 2. Thickness: 8 mm
 - 3. Finish: Glossy
 - 4. Color(s): White Ice Bright
 - 5. Basis of Design Product: Creative Materials Corp. "Omni" or equal.
 - 6. Location: Classrooms
 - 7. Pattern: Vertical Stack 1/3 overlap.
 - 8. Grout Color: As selected by Architect
- 2.4 SETTING MATERIALS

- A. Medium-Bed, Latex-Portland Cement Mortar. Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of up to 3/4 inch. Provide one of the following, or approved equal:
 - 1. MegaLite® Ultimate Crack Prevention Large Format Tile Mortar by Custom Building Products.
 - 2. 4-XLT by Laticrete.
 - 3. Large Tile and Stone Mortar by Mapei
- B. Latex-Portland Cement Mortar: Two component mortar system, comply with ANSI A118.4. Provide one of the following, or approved equal:
 - 1. Laticrete 317 with Laticrete 333 additive; Laticrete International, Inc.
 - 2. Kerabond with Keralastic; Mapei Corp.
 - 3. Or equivalent.

2.5 GROUTING MATERIALS

- A. Water-Cleanable Epoxy Grout for General Use: ANSI A118.3. with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Grout shall be stain resistant, color fast, mold and mildew inhibiting, non-sag, suitable for joints 1/16" to ½" and sanded type suitable for installing with glazed tiles.
 - 1. Basis of Design Product: Laticrete "Spectralock Pro Epoxy Grout" or equal.
 - 2. Colors: As selected by Architect.

2.6 MISCELLANEOUS MATERIALS

- A. Metal Edge Strips: Zinc alloy or stainless steel terrazzo strips, 1/8-inch wide at top edge with integral provision for anchorage to mortar bed or substrate unless otherwise indicated.
- B. Notched Trowel: Use type recommended by tile manufacturer for setting large-format tiles, for setting bed thickness utilized.
- C. Termination, Trim and Transition Strips: Provide Schluter units in Type 304 stainless steel with brushed finish, as scheduled below, or indicated on Drawings.
 - 1. Wall Tile Outside Corners Trim and Top Cap: RONDEC by Schluter or equal.
 - 2. Aluminum Cove Base Tile Edge Trim for Use at Base of Cafeteria: Schluter Systems Dilex-AHKA 0.313"W x 98.5"L in satin anodized finish, or equal.
- D. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by tile manufacturer for applications indicated.
- E. Grout Release: Product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.

- 1. Mapei "UltraCare Grout Release".
- 2. Miracle Sealants Co. "511 Impregnator"
- F. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- G. Grout Sealers: Water-based sealer for tile for protection from stains, as follows:
 - 1. Mapei "UltraCare Grout Sealer".
 - 2. Miracle Sealants Co. "511 Impregnator"

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and areas 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, and free from oil or waxy films and curing compounds.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications to prepare substrates indicated to receive tile.
- B. Use trowelable leveling and patching compounds per manufacturer's directions to fill cracks, holes, and depressions in substrates as required to provide suitable substrate for tile application.

- C. Broom or vacuum clean substrates to be covered by tiles immediately before tile installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
- D. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in 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.
- E. For large format tiles thin-set with medium bed mortar, provide the following surface preparation:
 - 1. Level substrates to 1/8-inch variance in 10 feet, with no more than 1/16 inch variation in 24 inches by the following method:
 - a. Skim coat and patch wall surfaces using manufacturer approved trowelapplied cement-based compound to bring surface into acceptable tolerances.
 - 2. There shall be no abrupt irregularities greater than 1/32"

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standard: Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile" that apply to type of setting and grouting materials and methods indicated.
- B. TCNA Installation Guidelines: TCNA "Handbook for Ceramic Tile Installation"; comply with TCNA installation methods indicated.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. 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 that plates, collars, or covers overlap tile.
 - 1. Cut and grind tile edges where they abut curved surfaces to produce a close and uniform abutting joint.
- E. Jointing Pattern: Lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise shown.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work

- F. Tile Patterns: Comply with pattern indicated on drawings.
- G. Expansion Joints: Provide expansion joints, control joints and pressure relieving joints of widths and at locations as per TCNA Handbook Construction #EJ171. Do not saw cut joints after installation of tiles.
 - 1. Sealing of joints is included in Division 07 Section "Joint Sealers."
- H. Apply grout release to tile surfaces prior to grouting. Prepare a small mock-up area of grout release application for Architect's approval before proceeding with application of grout release to installed tile surfaces.
- I. Grout tile to comply with ANSI A108.10.
- 3.4 WALL INSTALLATION METHODS
 - A. Wall Tile: Install tile to comply with requirements indicated below for setting-bed methods, TCNA installation methods related to subsurface wall conditions, and grout types:
 - 1. Gypsum Board and Cement Board TCNA W243, and as follows:
 - a. Bond Coat for Large Format Tile: Medium-Bed, Latex-Portland Cement Mortar, ANSI A108.5 over gypsum board.
 - b. Bond Coat for Other Tile: Latex-portland cement mortar, ANSI A108.5 over gypsum board.
 - c. Grout: Epoxy.
 - B. Joint Widths: 1/16".
- 3.5 CLEANING AND PROTECTION
 - A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout residue from tile as soon as possible.
 - 2. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
 - B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.
 - C. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures that tile is without damage or deterioration at time of Substantial Completion.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 093100

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes ceilings consisting of acoustical panels and exposed suspension systems.
 - B. Related Sections include the following:
 - 1. Acoustical sealants are specified in Division 07 Section "Joint Sealants"
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product specified
 - B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Ceiling suspension members.
 - 2. Method of attaching hangers to building structure.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 4. Minimum Drawing Scale: 1:100
 - C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on samples of size indicated below.
 - 1. 6-inch-(150-mm-) square samples of each acoustical panel type, pattern, and color.
 - 2. Set of 12-inch- (300-mm-) long samples of exposed suspension system members, including moldings, for each color and system type required.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicate compliance of acoustical panel ceilings and components with requirements based on comprehensive testing of current products.
- B. Research/Evaluation Reports: Evidence of acoustical panel ceiling's and components' compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
- C. Maintenance Data: For finishes to include in maintenance manuals.
- 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer..
- C. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 - 1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency .
 - b. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 2. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:
 - a. Smoke-Developed Index: 450 or less
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
 - B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
 - C. Handle acoustical panels carefully to avoid chipping edges, soiling panels or damaging units in any way.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Components: 10% of each type of panel installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide specified products by Armstrong World Industries or equivalent products.

2.2 ACOUSTICAL PANELS

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
 - 1. Mounting Method for Measuring Noise Reduction Coefficient: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.
 - 2. Provide fire-resistance rated panels where indicated.
- Acoustical Panels for Acoustical Panel Ceiling ACT 1: Provide panels to match existing; 24" x 24" x 5/8" Armstrong Fine Fissured FireGuard Angled Tegular 1833 in white (for 15/16" grid)
- C. Acoustical Panels for Acoustical Panel Ceiling ACT 2: Where this designation is indicated, provide acoustical panels complying with the following:
 - 1. Classification: Panels fitting ASTM E 1264 for Type XII, fiberglass with membrane-faced overlay; Form 2, water felted.
 - 2. Pattern: Panels fitting ASTM E 1264 pattern designation (description) E (lightly textured).
 - 3. Color: White.
 - 4. Light Reflectance Coefficient: Not less than LR 0.88.
 - 5. Noise Reduction Coefficient: 0.95
 - 6. Ceiling Attenuation Class: N/A
 - 7. AC: 190
 - 8. Fire Rating: Class A
 - 9. Sag Resistance Treatment: Armstrong HumiGuard Plus
 - 10. Anti-Mold and Mildew Treatment: BioBlock
 - 11. Warranty: 30 year
 - 12. Edge Detail: Square tegular lay-in.
 - 13. Thickness: 1 inch.

- 14. Size: 48 by 48 inches.
- 15. Basis of Design Product: Armstrong Optima Square Tegular #3256.
- 16. Location: Cafeteria
- D. Acoustical Panels for Acoustical Panel Ceiling ACT 4: Provide panels complying with the following:
 - 1. Classification: Panels fitting ASTM E 1264 for Type IV, wet-formed mineral fiber with membrane-faced overlay; Form 2, water felted.
 - 2. Pattern: Panels fitting ASTM E 1264 pattern designation (description) E (lightly textured).
 - 3. Color: White.
 - 4. Light Reflectance Coefficient: Not less than LR 0.88.
 - 5. Noise Reduction Coefficient: N/A
 - 6. Ceiling Attenuation Class: N/A
 - 7. Fire Rating: Class A
 - 8. Sag Resistance Treatment: Armstrong HumiGuard Plus
 - 9. Anti-Mold and Mildew Treatment: BioBlock
 - 10. Warranty: 30 year
 - 11. Edge Detail: Beveled tegular.
 - 12. Thickness: 3/4 inch.
 - 13. Size: 6 by 48 inches.
 - 14. Basis of Design Product: Armstrong Ultima Tech Zone, No. 1423
 - 15. Location: Library
- E. Acoustical Panels for Acoustical Panel Ceiling ACT 5: Provide panels complying with the following:
 - 1. Classification: Panels fitting ASTM E 1264 for Type IV, wet-formed mineral fiber with membrane-faced overlay; Form 2, water felted.
 - 2. Pattern: Panels fitting ASTM E 1264 pattern designation (description) E (lightly textured).
 - 3. Color: White.
 - 4. Light Reflectance Coefficient: Not less than LR 0.88.
 - 5. Noise Reduction Coefficient: NRC 0.75
 - 6. Ceiling Attenuation Class: Not less than CAC 35
 - 7. Fire Rating: Class A
 - 8. Sag Resistance Treatment: Armstrong HumiGuard Plus
 - 9. Anti-Mold and Mildew Treatment: BioBlock
 - 10. Warranty: 30 year
 - 11. Edge Detail: Beveled tegular.
 - 12. Thickness: 3/4 inch.
 - 13. Size: 24 by 24 inches.
 - 14. Basis of Design Product: Armstrong Ultima, No. 1912
 - 15. Location: Library, Tech Zone field.
- 2.3 METAL SUSPENSION SYSTEMS

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
 - 1. Provide fire-resistance rated metal suspension system where indicated
- B. Suspension System for Acoustical Panel Ceilings ACT 2, ACT 4 and ACT 5: Narrow-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 (Z120) coating designation, with prefinished 9/16-inch- wide metal caps on flanges; other characteristics as follows:
 - 1. Structural Classification: Intermediate-duty system.
 - 2. End Condition of Cross Runners: Override (stepped) or butt-edge type, as standard with manufacturer.
 - 3. Face Design: Flush face.
 - 4. Cap Material: Steel sheet.
 - 5. Cap Finish: White.
 - 6. Basis of Design Product: Armstrong Suprafine.
- C. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.
 - 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 per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.
- E. Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish and color as that used for exposed flanges of suspension system runners.
- F. Hold-Down Clips: Where indicated or required for fire-rating, provide manufacturer's standard hold-down clips spaced 24 inches (610 mm) o.c. on all cross tees.
- 2.4 ACOUSTICAL SEALANT

A. Refer to Division 07 Section "Joint Sealants".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and 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 other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with publications referenced below per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
 - 1. Standard for Ceiling Suspension System Installations: Comply with ASTM C 636.
 - 2. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for

substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

- 5. Do not attach hangers to steel deck tabs.
- 6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
- 7. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches (200 mm) from ends of each member.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 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 (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3 mm in 3.6 m). Miter corners accurately and connect securely.
 - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.
 - 2. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

SECTION 095429 - WOOD PLANK CEILING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Wood plank ceiling units and concealed suspension systems.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product specified
 - B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Layout of linear planks in relation to room orientation
 - 2. Joint patterns between planks.
 - 3. Ceiling suspension members.
 - 4. Method of attaching hangers to building structure.
 - 5. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 6. Minimum Drawing Scale: 1:100
 - C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on samples of size indicated below.
 - 1. 12-inch- (300-mm-) long samples of each plank type, pattern, and color.
 - 2. Set of 12-inch- (300-mm-) long samples of exposed suspension system members, including moldings, for each color and system type required.
 - 3. Minimum 6" long section of each type of wood molding and trim required.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicate compliance of plank ceilings and components with requirements based on comprehensive testing of current products.
- B. Research/Evaluation Reports: Evidence of plank ceilings' and components' compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
- C. Maintenance Data: For finishes to include in maintenance manuals.
- 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed plank ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of plank ceiling system including all attachment and suspension components through one source from a single manufacturer.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver planks and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
 - B. Before installing planks, permit them to reach room temperature and a stabilized moisture content.
 - C. Handle planks carefully to avoid chipping edges or damaging units in any way.
- 1.6 PROJECT CONDITIONS
 - A. Environmental Limitations: Do not install plank ceilings until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- 1.7 COORDINATION
 - A. Coordinate layout and installation of planks and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.
 - 1. Cut ceiling planks to accommodate installation of light fixtures as required.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Fire-Test-Response Characteristics: Provide plank ceilings that comply with the following requirements:
 - 1. Surface-Burning Characteristics: Provide wood planks meeting Class A requirements tested per ASTM E 84.
- 2.2 WOOD PLANK SYSTEM
 - A. Flat Veneered Wood Planks System (ACTWD-3): FSC Certified fire-retardant particle board core with face-cut veneers, and factory-applied black fleece on the back of plank.

- 1. Wood Veneer: Maple.
- 2. Module Size: Nominal 4-1/2"
- 3. Plank Width: 3-3/4"
- 4. Plank Spacing: 3/4" reveal
- 5. Plank Size: 96" L x 3-1/4" W x 3/4" thick
- 6. Plank Backing: Factory-applied black fleece on the back.
- 7. Finish: Maple NMP.
- 8. Fire Rating: Class A
- 9. NRC: 0.45
- 10. Basis of Design Product: Woodworks Linear Veneered Planks #6440W1 by Armstrong, or equal products by one of the following:
 - a. ASI
 - b. CertainTeed
- B. Accessories: Provide solid wood trim to match planks and all metal installation accessories as required for complete installation.
- 2.3 METAL SUSPENSION SYSTEMS
 - A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of type, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
 - B. Suspension System for ACT-3: Manufacturer's standard wide-face, capped, double-web, steel suspension system with main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 (Z120) coating designation, with prefinished 15/16-inch-(24-mm-) wide metal caps on flanges; other characteristics as follows:
 - 1. Face Design: Flush face.
 - 2. Cap Material: Steel sheet.
 - 3. Cap Finish: Manufacturer's standard factory-applied painted finish in black.
 - Basis of Design Product: Armstrong Prelude XL or equal by one of the following:
 a. ASI
 - b. CertainTeed
 - C. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.
 - 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 per ASTM E 1190, conducted by a qualified testing and inspecting agency.
 - D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

- 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
- 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and structural framing to which planks and suspension systems attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and other conditions affecting performance of wood ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other anchors whose installation is specified in other Sections.
- B. Measure each area and establish layout of planks to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width planks at borders, and comply with layout shown on reflected ceiling plans and shop drawings.

3.3 CEILING INSTALLATION

- A. General: Install plank ceilings to comply with publications referenced below per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
 - 1. Standard for Ceiling Suspension System Installations: Comply with ASTM C 636.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to

inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

- 5. Do not attach hangers to steel deck tabs.
- 6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
- 7. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches (200 mm) from ends of each member.
- C. Install edge moldings and trim of type indicated at perimeter of ceiling areas and where necessary to conceal edges of planks.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install planks with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut planks at borders and penetrations to provide a neat, precise fit.
 - 1. Arrange directionally patterned planks as indicated on reflected ceiling plans.
 - 2. Install clips to attach planks to suspension system in conformance with manufacturer's directions.
- F. Install acoustical infill batts in accordance with manufacturer's directions.

3.4 CLEANING

A. Clean exposed surfaces of planks, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

SECTION 096400 - WOOD FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Solid-wood plank flooring for treads at learning stairs, factory finished.
 - 2. Solid-wood plank flooring for seating platforms at learning stairs, factory finished.
- B. Related work specified elsewhere:
 - 1. Wood subfloor is specified in Division 06 Section "Miscellaneous Rough Carpentry."
 - 2. Wood riser cladding is specified in Division 06 Section "Interior Architectural Woodwork."
- 1.2 SUBMITTALS
 - A. Product Data: For each type of product indicated.
 - B. Shop Drawings: Show installation details including location and layout of each type of wood flooring and accessory.
 - C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.
 - 1. Include Samples of accessories involving color and finish selection
 - D. Samples for Verification: For each type of wood flooring and accessory, with each stain color and finish required, approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work. Include sample sets showing the full range of normal color and texture variations expected.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed wood flooring similar in material, design, and extent to that indicated for this Project and whose work has resulted in wood flooring installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of material and product from one source with resources to provide materials and products of consistent quality in appearance and physical properties.
- C. Hardwood Flooring: Comply with NWFA grading rules for species, grade, and cut.

- D. Mockups: Build mockups to verify selections made under sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Provide in-place sample of two adjacent treads with risers demonstrating the two stain colors selected, in location directed by Architect.
 - 2. Reprepare mock-up as required to obtain Architect's approval.
 - 3. Obtain Architect's approval of visual qualities before proceeding with work.
 - 4. Protect approved mock-ups until all work has been completed.
 - 5. Approved mock-ups will represent the minimum standard of acceptability for each portion of the work.
 - 6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.
 - B. Store wood flooring materials in a dry, warm, well-ventilated, weathertight location.
 - C. Move wood flooring into spaces where it will be installed, at least seven days before installation.
- 1.5 PROJECT CONDITIONS
 - A. Conditioning: Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75 deg F (18 and 24 deg C) in spaces to receive wood flooring for at least seven days before installation, during installation, and for at least seven days after installation. After post-installation period, maintain relative humidity and ambient temperature planned for building occupants.
 - 1. Open sealed packages to allow wood flooring to acclimatize.
 - 2. Do not install flooring until it adjusts to the relative humidity of and is at the same temperature as the space where it is to be installed.
 - 3. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by flooring and finish manufacturers.

PART 2 - PRODUCTS

2.1 FACTORY FINISHED SOLID-WOOD PLANK FLOORING

- A. Solid-Wood Flooring, Factory-Finished: Kiln dried to 6 to 9 percent maximum moisture content; tongue and groove and end matched; with backs channeled.
 - 1. Species: Maple.
 - 2. Grade: Select and Better.
 - 3. Cut: Rift and Quartered.
 - 4. Thickness: 5/4 inch.

- 5. Face Width: 5 inches
- 6. Edge Style: Square.
- 7. Lengths: Random-length strips complying with applicable grading rules.
- 8. Finish: UV urethane.
 - a. Colors: Two colors, as selected by Architect from manufacturer's full range.

2.2 ACCESSORY MATERIALS

- A. Felt Underlayment: ASTM D 226, Type I, No. 15, asphalt-saturated felt.
- B. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.
- C. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installing Hardwood Flooring."
- D. Cork Expansion Strip: Composition cork strip complying with FS HH-C-576, Type I-B, Class 2.
- E. Wood Trim: In same species and grade as wood flooring, unless otherwise indicated.
 - 1. Nosing: 5/4" thick, continuous stair nosing, in stain color as selected by Architect.
 - 2. Feature Strip in Treads: 1 inch wide, solid wood insert, in stain color as selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of wood flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with flooring manufacturer's written instructions, but not less than recommendations in NWFA's "Installing Hardwood Flooring," as applicable to flooring type.
- B. Pattern: Lay wood flooring in pattern indicated on Drawings or, if not indicated, as directed by Architect.
- C. Expansion Space: Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch (19 mm), unless otherwise indicated on Drawings.
 - 1. Unless fully concealed by trim, fill expansion space with flush cork expansion strip.

- D. Felt Underlayment: Where strip or plank flooring is nailed to solid-wood subfloor, install flooring over a layer of asphalt-saturated felt.
- E. Solid-Wood Strip and Plank Flooring: Blind nail or staple flooring to substrate according to NWFA's written recommendations.
 - 1. Plank Flooring: For flooring of face width more than 3 inches (76 mm):
 - a. Hardwood: Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.
- 3.3 PROTECTION
 - A. Cover installed wood flooring to protect it from damage or deterioration, before and after finishing, during remainder of construction period. Use heavy kraft-paper or other suitable covering. Do not use plastic sheet or film that could cause condensation.
 - 1. Do not move heavy and sharp objects directly over kraft-paper-covered wood flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring

SECTION 096466 - WOOD ATHLETIC FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Solid-wood strip flooring.
 - 2. Subfloor panels with resilient pads and metal anchor channels.
 - 3. Vapor barrier.
 - 4. Finishing wood floors.
 - 5. Floor markings
 - 6. Ventilating wall base.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product indicated.
 - B. Shop Drawings: Show installation details including location and layout of each type of wood flooring and accessory. Include expansion provisions and trim details. Include scaled layout drawing of game line markings and locations of floor sleeves for equipment.
 - C. Samples for Initial Selection: Manufacturer's color charts showing colors and glosses available for the following:
 - 1. Floor finish.
 - 2. Game line paint.
 - D. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work. Include sample sets showing the full range of normal color and texture variations expected.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: for installer and manufacturer.
 - B. Test Reports: Independent testing report showing the flooring system has passed all performance criteria.
 - C. Maintenance instructions.
- 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed wood athletic flooring systems similar in material, design, and extent to that indicated for this Project and is approved by the flooring manufacturer to install their flooring system.
- B. Manufacturer Qualifications: Manufacturer shall be a member in good standing of the Maple Flooring Manufacturers Association (MFMA).
- C. Source Limitations: Obtain each type of material and product from one source with resources to provide materials and products of consistent quality in appearance and physical properties.
- D. Maple Flooring: Comply with MFMA grading rules for grade and cut.
 - 1. Certification: Provide flooring that carries MFMA Certification Mark on each piece.
- E. Wood flooring system shall meet or exceed the following performance criteria:
 - 1. MFMA PUR
 - 2. DIN 18032 Part2 2001
 - 3. DIN 18032 Part2 1991
 - 4. ASTM F2772 Sport Floor Standards
 - 5. FIBA International Standards
 - 6. EN 14904 Standards
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver wood flooring materials in unopened cartons or bundles.
 - B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.
 - C. Store wood flooring materials in a dry, warm, well-ventilated, weathertight location.
 - D. Move wood flooring into spaces where it will be installed, at least seven days before installation.
- 1.6 PROJECT CONDITIONS
 - A. Conditioning: Maintain relative humidity of 35% to 50% and an ambient temperature between 55 and 80 deg F in spaces to receive wood flooring for at least seven days before installation, during installation, and for at least seven days after installation. After post-installation period, maintain relative humidity and ambient temperature planned for building occupants.
 - 1. For unfinished products, open sealed packages to allow wood flooring to acclimatize.
 - 2. Do not install flooring until it adjusts to the relative humidity of and is at the same temperature as the space where it is to be installed.

- 3. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by flooring and finish manufacturers.
- B. Moisture Testing of Concrete Substrates: Perform moisture tests recommended by manufacturer and as follows:
 - 1. Testing Procedures: Perform moisture meter tests as required by wood flooring manufacturers.
 - a. Moisture Meter Testing: Relative humidity test using in situ probes, ASTM F 2170.
 - 2. Proceed with installation only after substrates do not exceed maximum relative humidity level measurement acceptable to flooring material manufacturer.
- C. Do not install floor system until concrete has been cured 60 days, unless otherwise permitted by flooring manufacturer.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Manufacturers: Provide Basis of Design system manufactured by Robbins Sport Surfaces or equal system by one of the following:
 - 1. Action Floor Systems
 - 2. Conner Sports.
- 2.2 WOOD ATHLETIC FLOORING SYSTEM
 - A. Basis of Design System: provide Robbins Bio-Channel Star floor system by Robbins, Inc. or equal. system consists of maple strip flooring, subflooring, resilient pads, and metal anchor channels.
 - B. Maple Strip Flooring: Northern hard maple (Acer saccharum), kiln dried.
 - 1. Grade: Second & Better.
 - 2. Cut: Flat grain.
 - 3. Type: Finger-jointed
 - 4. Lengths: Nominal 15 to 96 inches complying with MFMA grading rules, unless otherwise required for patterns indicated.
 - 5. Matching: Tongue and groove, side matched and end matched.
 - 6. Expansion Feature: XL Plus technology to reduce or eliminate routine spacing for expansion.
 - 7. Backs: Channeled (kerfed) for stress relief.
 - 8. Thickness: 25/32 inch
 - 9. Face Width: 2-1/4 inches.
 - 10. Basis of Design Product: Continuous Strip XLPLUS by Robbins, or equal.

- C. Subfloor/Underlayment: Premanufactured plywood panels factory prepared to receive anchor channels.
 - 1. Basis of Design Product: Bio-Channel Star by Robbins or equal.
- D. Resilient Pads: 9/16" Zero/G shock pad by Robbins.
- E. Metal anchor channels.

2.3 FINISHING MATERIALS

- A. Urethane Finish System: Complete system of compatible components that is recommended by finish manufacturer for application indicated.
 - 1. VOC Content: When calculated according to 40 CFR 59, Subpart D (EPA Method 24), as follows:
 - a. Finish Coats and Floor Sealers: Not more than 350 g/L.
 - 2. Type: Solvent-based, oil-modified.
 - 3. Floor Sealer: Pliable, penetrating type.
 - 4. Finish Coats: Formulated for multicoat application on wood flooring.
 - 5. Manufacturers: Provide products by flooring manufacturer or one of the following as approved by flooring manufacturer:
 - a. Bona Sport Poly; Bona.
 - b. DuraSeal Masterline Oil Polyurethane Gloss; Dura Seal.
 - c. 450 Gym Finish; Hillyard Floor Treatments.
- B. Wood Filler: Formulated to fill and repair seams, defects, and open-grain hardwood floors; compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved samples, provide pigmented filler.
- C. Game-Line and Marker Paint: High-gloss enamel compatible with finish and recommended by finish and paint manufacturers for this purpose.
 - 1. Colors: all colors as indicated on Drawings
 - a. 2 colors for game lines of basketball and volleyball.
 - b. 3 additional colors for Y logo

2.4 ACCESSORY MATERIALS

- A. Vapor Retarder: ASTM D 4397, polyethylene sheet not less than 6.0 mils (0.15 mm) thick.
- B. Fasteners and Adhesives: Type and size recommended by manufacturer, but not less than those recommended by the following:
 - 1. MFMA for application indicated for maple flooring.

- 2. Channel Anchors: Type recommended by flooring manufacturer.
- C. Wall Base: 6" high molded vented cove base with pre-molded outside corners, in color selected by Architect.
- D. Provide all accessories at door thresholds for a complete installation.
- 2.5 INSTALLATION ACCESSORIES
 - A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of wood flooring. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Concrete Slabs: Verify that concrete slabs comply with requirements specified Division 03 Section "Cast-in-Place Concrete."
 - 1. Grind high spots and fill low spots to provide a maximum 1/8-inch deviation in any direction when checked with a 10-foot straight edge.
 - 2. Use trowelable leveling and patching compounds per flooring manufacturer's directions to fill cracks, holes, and depressions in substrates and to patch and level floors as required to provide suitable substrate for flooring application.
- C. Concrete Moisture Testing: Perform moisture meter test as per manufacturer's directions and in accordance with ASTM F 2170, as follows:
 - 1. Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m) and perform not less than 2 tests in each installation area with test areas evenly spaced in installation area.
 - 2. Proceed with installation only after substrates have maximum relative humidity of 85% or less.

3.2 INSTALLATION

- A. General: Comply with flooring system manufacturer's written instructions, but not less than recommendations of MFMA applicable to flooring type indicated for maple flooring.
- B. Pattern: Lay flooring parallel with the long dimension of the space to be floored, unless otherwise indicated.

- C. Expansion Space: Provide expansion space at walls and other obstructions and terminations of flooring of not less than 2".
- D. Vapor Retarder: Install a layer of polyethylene sheet over concrete slab with edges overlapped minimum 6" and sealed, and turned up behind baseboards.
- E. Subfloor/Underlayment: Place subfloor assembly in end-to-end manner, staggering end joints in adjacent rows, with 1/4" gap between panels. Place panels on a 45 degree angle to the direction of the maple flooring. Install solid blocking under bleachers in the stacked position, at doorways and elsewhere as recommended by manufacturer.
- F. Anchor Channels: Place metal anchor channels in preformed slots in the subfloor panels., and anchor in pre-routed holes.
- G. Solid-Wood Strip and Plank Flooring: Install maple flooring parallel to main playing court by power nailing at intervals recommended by manufacturer. End joints shall be properly driven up. Provide spacing for humidity control as recommended by flooring manufacturer.
- H. Installation Tolerances: 1/8 inch in 10 feet variance from level.
- 3.3 SANDING AND FINISHING
 - A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.
 - B. Apply filler according to manufacturer's written instructions.
 - 1. Fill open-grained hardwood.
 - 2. Fill and repair seams and defects.
 - C. Apply floor sealer according to finish manufacturer's written instructions, in number of coats recommended by finish manufacturer.
 - D. Apply floor finish according to finish manufacturer's written instructions. Apply in number of coats recommended by finish manufacturer for application indicated, but not less than two.
 - E. Lines and Markers: After applying sealer coats, screening, and vacuuming of floor, lay out lines, fields and other markings as indicated for colored enamel application. Mask flooring to provide sharp edges. Apply gym enamel 1.0 mil thick, in colors as indicated. Where game lines cross, break minor game line at intersection; do not overlap lines.
 - 1. For game markings, use current rules of the National Federation of High School Association or other association having jurisdiction.
 - F. Install base trim and other cover trim as indicated for expansion spaces at edges and interruptions of flooring. Cement or screw to walls.

3.4 PROTECTION

- A. Cover installed wood flooring to protect it from damage or deterioration, before and after finishing, during remainder of construction period. Use heavy kraft-paper or other suitable covering. Do not use plastic sheet or film that could cause condensation.
 - 1. Do not cover site-finished floors with kraft paper, or any other material, until finish reaches full cure, but not less than seven days after applying last coat.

SECTION 096500 - RESILIENT FLOORING AND ACCESSORIES

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes the following:
 - 1. Vinyl composition tile flooring
 - 2. Luxury vinyl flooring
 - 3. Rubber wall base.
 - 4. Resilient flooring accessories.
- 1.2 ACTION SUBMITTALS
 - A. Product data for each type of product specified.
 - B. Samples for verification purposes in form of actual flooring or sections of accessories for each color and pattern specified.
 - C. Shop Drawings: Indicate decorative pattern layout, if any. Show location of seams and edges. Indicate location of columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutout locations.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Maintenance data for resilient flooring and accessories.
- 1.4 QUALITY ASSURANCE
 - A. Single-Source Responsibility for Floor Tile and Accessories: Obtain each type, color, and pattern of tile and accessory from a single source.
 - B. Fire Performance Characteristics: Provide resilient flooring with the following fire performance characteristics as determined by testing products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux: 0.45 watts per sq. cm or more, Class 1, per ASTM E 648 or NFPA 253.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Store resilient materials on flat surface in dry space protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).

B. Move floor coverings and installation accessories into spaces where they will be installed at least 48 hours before installation, unless longer conditioning periods are recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive resilient flooring for at least 72 hours prior to installation, during installation, and for not less than 72 hours after installation. After this period, maintain a temperature of not less than 55 deg F (13 deg C).
- B. Moisture Testing of Concrete Substrates: Perform moisture tests recommended by manufacturer and as follows:
 - 1. Testing Procedures: Perform calcium chloride or moisture meter tests as required by floor topping and resilient tile manufacturers.
 - a. Calcium Chloride Testing: Anhydrous calcium chloride test, ASTM F 1869.
 - b. Moisture Meter Testing: Relative humidity test using in situ probes, ASTM F 2170.
 - 2. Proceed with installation only after substrates do not exceed maximum moisture-vapor-emission rate or relative humidity level measurement acceptable to flooring material manufacturer.
- C. Do not install flooring or accessories until they are at the same temperature as the space where they are to be installed.
- D. Close spaces to traffic during flooring installation.
- 1.7 SEQUENCING AND SCHEDULING
 - A. Install flooring and accessories after other finishing operations, including painting, have been completed.

1.8 EXTRA MATERIALS

A. Extra Materials: Furnished from same production run as resilient base and accessories installed. Furnish 10% of each type and color of material provided in the work. Package materials with protective covering and identify with labels describing contents. Deliver extra materials to Owner.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

- 1. Tiles:
 - a. Armstrong World Industries
 - b. Mannington
 - c. Altro
 - d. Johnsonite
 - e. Tandus Centiva
- 2. Base and Other Accessories:
 - a. Endura
 - b. Flexco
 - c. Roppe
 - d. Johnsonite

2.2 PRODUCTS, GENERAL

- A. Colors, Textures, and Patterns: Provide tile, sheet goods and accessories in color, texture and pattern to match specified products. Colors and patterns indicated by reference to manufacturer's name and designations are for color and pattern identification only and are not intended to limit selection of other manufacturer's products with similar colors and patterns. If no colors or patterns are indicated, provide color(s) and pattern(s) as selected by Architect from manufacturer's standards.
- 2.3 RESILIENT TILE FLOORING
 - A. Vinyl Composition Tile (VCT): ASTM F 1066, Class 2, through-pattern.
 - 1. Thickness: 1/8"
 - 2. Tile Size: 12" x 12"
 - 3. Colors: Match existing.
 - 4. Basis of Design Product: Match existing.
 - 5. Location: Where existing VCT flooring is disturbed for installation of mechanical work.
 - B. Luxury Vinyl Tile (VT): Luxury vinyl tile complying with ASTM F1700, Class III, Type B and as follows:
 - 1. Basis of Design Product: Shaw Contract "Strand" 0516V from the Surface + Strand Collection..
 - 2. Size: 18" x 36"
 - 3. Thickness: 0.098 inches
 - 4. Wear Layer Thickness: 20 mil
 - 5. Edges: Square
 - 6. Finish: ExoGuard
 - 7. Color: Wool 16115
 - 8. Location: CoLab off Vestibule.
 - 9. Installation Method: Ashlar.
- 2.4 RESILIENT WALL BASE

- A. Rubber Wall Base: ASTM F 1861, Type TP, Group 1 (solid), 4" high, 1/8" thick, smooth surface, and as follows:
 - 1. Style: Straight (toeless) style for all carpeted areas and cove base with toe (set-on type) elsewhere
 - 2. Lengths: Coils in manufacturer's standard length.
 - 3. Inside and Outside Corners: Preformed.
 - 4. Products: As selected by Architect.
 - 5. Colors: As selected by Architect.

2.5 MISCELLANEOUS RESILIENT ACCESSORIES

- A. Colors: As selected by Architect from manufacturer's full range of colors produced for accessory molding complying with requirements indicated.
- B. Rubber Accessory Moldings: Provide rubber accessory molding complying with the following:
 - 1. Product Description: Carpet edge for glue-down applications, carpet nosing, reducer strip for resilient flooring, tile and carpet joiner, and resilient nosing for carpeted stair treads.
 - 2. Profile and Dimensions: As indicated or required.
- 2.6 INSTALLATION ACCESSORIES
 - A. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.
 - 1. Use primers that have a VOC content of not more than 200 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - B. Concrete Sealer: Type recommended and approved by resilient flooring manufacturer and adhesive manufacturer to ensure proper adhesion of resilient flooring to substrate.
 - 1. Use sealers that have a VOC content of not more than 200 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - C. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.
 - D. Adhesives (Cements): Products supplied by resilient flooring and accessory manufacturers, of type recommended to suit resilient products and substrate conditions indicated.
 - 1. Use adhesives that have a VOC content of not more than the following when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - a. Wall Base, Accessories: 50 g/L

E. Floor Polish: Acrylic type, as recommended by flooring material manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Examine areas where installation of flooring will occur, with Installer present, to verify that substrates and conditions are satisfactory for flooring installation and comply with flooring manufacturer's requirements and those specified in this Section.
- 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 whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond tests recommended by flooring manufacturer.
 - 2. Finishes of subfloors comply with tolerances and other requirements specified in Division 03 Section "Cast-In-Place Concrete" for slabs receiving resilient flooring.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.
- C. Concrete Moisture Emission Tests: Perform calcium chloride test as per manufacturer's directions, as follows, and other tests if recommended by resilient flooring and adhesive manufacturer:
 - 1. Perform moisture test at rate of one per 2,000 sq.ft. of new and existing floor area to be covered.
 - 2. Report test results in writing to Architect, and Contractor within 24 hours after tests are completed. Reports of concrete moisture emission tests shall contain the Project identification name and number, date of test location of test within structure.
 - 3. Perform additional moisture emission tests of in-place concrete when test results indicate specified moisture content has been exceeded, as directed by Architect.
 - a. Repeat test one week after initial test minimally and additionally repeat test if required by field conditions to determine moisture levels in area of resilient flooring application.
- D. Do not proceed with installation until unsatisfactory conditions have been corrected.
- E. Only if it is not possible to provide a concrete substrate with acceptable moisture levels, then a surface applied moisture mitigation system shall be used that meets the requirements of ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings.

3.2 PREPARATION

A. General: Comply with manufacturer's installation specifications to prepare substrates indicated to receive flooring.

- B. Use trowelable leveling and patching compounds per flooring manufacturer's directions to fill cracks, holes, and depressions in substrates and to patch and level floors as required to provide suitable substrate for flooring application.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives by using a grinder, sander, or polishing machine with a heavy-duty wire brush.
- D. Broom or vacuum clean substrates to be covered by flooring immediately before installation of flooring. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
- E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.
- F. Seal concrete substrates as required by moisture test results to ensure proper adhesion of resilient flooring to substrate.
- 3.3 TILE INSTALLATION
 - A. General: Comply with tile manufacturer's installation directions and other requirements indicated that are applicable to each type of tile installation included in Project.
 - B. Lay out tiles from center marks established with principal walls so tiles at opposite edges of room are of equal width. Install tiles square with room axis, unless otherwise indicated.
 - C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles in decorative patterns as indicated on Drawings.
 - D. Scribe, cut, and fit tiles to butt tightly to vertical surfaces and edgings.
 - E. Extend tiles into toe spaces, door reveals, closets, 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 chalk or other nonpermanent, nonstaining marking device.
 - G. Install tiles on covers for telephone and electrical ducts, and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on covers. Tightly adhere edges to perimeter of floor around covers and to covers.
 - H. Adhere tiles to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed tile installation.

- I. Use full spread of adhesive applied to substrate in compliance with tile manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times.
- J. Hand roll tiles where required by tile manufacturer.
- 3.4 INSTALLATION OF WALL BASE AND ACCESSORIES
 - A. General: Install resilient accessories according to manufacturer's written installation instructions.
 - B. Apply resilient wall base to walls, pilasters, casework, and other permanent fixtures in rooms and areas where base is required. Install wall base in lengths as long as practicable. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
 - 1. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
 - 2. Install preformed corners as per manufacturer's directions.
 - C. Place resilient accessories so they are butted to adjacent materials of type indicated and bond to substrates with adhesive. Install reducer strips at edges of flooring that otherwise would be exposed.
- 3.5 CLEANING AND PROTECTION
 - A. Perform the following operations immediately after completing installation:
 - 1. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturers.
 - 2. Sweep or vacuum floor thoroughly.
 - 3. Do not wash floor until after time period recommended by resilient flooring manufacturer.
 - 4. Damp-mop flooring to remove black marks and soil.
 - B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by flooring manufacturer.
 - 1. Apply protective floor polish to flooring surfaces that are free from soil, visible adhesive, and surface blemishes. Coordinate selection of floor polish with Owner's maintenance service requirements.
 - 2. Cover flooring with undyed, untreated building paper until inspection for Substantial Completion.
 - C. Clean flooring not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean flooring using method recommended by manufacturer.

- 1. Strip protective floor polish that was applied after completing installation prior to cleaning.
- 2. Reapply floor polish after cleaning.

SECTION 096616 - PORTLAND CEMENT TERRAZZO FLOORING RESTORATION

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Extent of terrazzo repair and restoration work is as shown on the Drawings and as specified herein.
 - B. Terrazzo repair and restoration work includes:
 - 1. Patching and repair of existing terrazzo floor in locations where existing floor is spalled or damaged, to match existing.
 - 2. Cleaning and refinishing existing terrazzo floor.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information and installation instructions for each type of terrazzo, accessory item, and material required.
- B. Certification: Submit 2 copies of supplier's/manufacturer's written certification that terrazzo materials meet or exceed specified NTMA properties.
- C. Samples:
 - 1. Flooring: Submit 6" minimum square samples of each pattern, color and type of terrazzo required for flooring. Submit samples after existing floor has been cleaned and refinished to ensure best color match of new terrazzo to existing. Include with each sample a listing of the ingredients used to produce the mixture and proportions of each ingredient in the mix.
- D. Maintenance Instructions: Submit 2 copies of written instructions for recommended periodic maintenance of each type of terrazzo.
- E. Mock-Ups: Prepare mock-ups of types indicated below following requirements of this section. Reprepare mock-ups as many times as required by Architect until satisfactory result is obtained, as judged solely by Architect. Obtain Architect's approval of visual qualities before proceeding with work. Protect approved mock-ups until all work has been completed. Approved mock-ups will represent the minimum standard of acceptability for each portion of the work.
 - 1. Provide in-place sample of at least 25 sq. ft. in area, demonstrating cleaning and refinishing of existing terrazzo floor.
 - 2. Provide in-place sample of approximately 10 sq. ft. in area, demonstrating patching of existing terrazzo floor.

1.3 QUALITY ASSURANCE

096616 - 1 PORTLAND CEMENT TERRAZZO FLOORING RESTORATION

- A. Installer: Work must be performed by a firm having not less than five (5) years successful experience in terrazzo repair and restoration work similar to work of this project.
- B. Restoration Specialists: Terrazzo repair and restoration work shall be done only by skilled workers who have demonstrated experience in the type of work specified and who are thoroughly familiar with the requirements of the work. In acceptance or rejection of terrazzo work, no allowance will be made for lack of skill on the part of the workers.
- C. NTMA Standards: Comply with applicable provisions and recommendations of National Terrazzo and Mosiac Association, Inc., as specified.
- D. Manufacturer's Instructions: In addition to specified requirements, comply with resin manufacturer's instructions and recommendations, including preparation of substrate, storing, mixing and applying materials, finishing, and curing of resinous matrix terrazzo work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide terrazzo products by one of the following manufacturers (within each product category) or equal:
 - 1. Cleaners and Sealers:
 - a. Bestal.
 - b. General Polymers Corp.
 - c. Hillyard Chemical Company.
 - d. Multi-Clean Div./H.B. Fuller Company.
 - e. National Laboratories.

2.2 CEMENTITIOUS TERRAZZO MATERIALS

- A. Portland Cement: ASTM C 150, Type I, except as modified to comply with NTMA requirements for compressive strength. Obtain cement from a single source for all work of each required color.
 - 1. Provide non-staining white cement for terrazzo matrix as required to match existing.
 - 2. Provide standard gray cement for underbed.
- B. Sand: ASTM C33.
- C. Water: Clean, free of oil, soluble salts or other deleterious substances.
- D. Aggregate: Natural, sound, crushed marble chips without excessive flats or flakes, complying with NTMA requirements.

- 1. Colors and gradation of aggregate sizes as required to match existing.
- E. Matrix Pigments: Pure mineral or synthetic pigments, resistant to alkalies and non-fading. Mix pigments with matrix to provide required colors.

2.3 REPAIR MATERIALS FOR SMALL HOLES AND SPALLS

- A. At Contractor's option, provide one of the following matrices for repairing small holes or spalls in terrazzo:
 - 1. Polyester Resin Terrazzo Matrix: Two-component polyester resin and hardener, mineral filler and color pigment, complying with NTMA "Guide Specification for Polyester Terrazzo" and as required to match appearance of existing terrazzo.
 - 2. Epoxy Resin Terrazzo Matrix: Thermosetting, amine-cured epoxy resin and hardener, mineral filler and color pigment, complying with NTMA "Guide Specification for Epoxy Terrazzo" and as required to match appearance of existing terrazzo.
- B. Aggregates: Natural, sound, crushed marble chips, colors selected and graded to match existing terrazzo, but with maximum size within limits of workability for the terrazzo crack to be patched.
- C. Substrate Primer: Two-component resin or other compound, recommended by matrix manufacturer, to penetrate and seal substrate and provide maximum bond of terrazzo to substrate.
- D. Finishing Grout: Resin or other compound with filler and pigments, as recommended by matrix manufacturer.

2.4 TERRAZZO ACCESSORIES

- A. Divider Strips: Depth and style as required for type and thickness of terrazzo. Width, material and color to match existing. Provide angle or "T"-type for adhesive bonding to substrate.
- B. Control or Expansion Strips: Double or split units, 1/8" wide, of same material and color as the divider strips. Provide 1/8" wide filler of same depth as strips, laminated between the strips.
- C. Divider Strip Adhesive: Trowelable mixture of fine sand and bonding agent, specially compounded by manufacturer for this use.
- D. Cleaner: Liquid, neutral chemical cleaner, with Ph factor between 7 and 10, of formulation recommended by sealer manufacturer for type of terrazzo used, and complying with NTMA requirements.

E. Interior Floor Sealer: Colorless, slip and stain resistant penetrating sealer with Ph factor between 7 and 10, which will not affect color or physical properties of terrazzo surface.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with NTMA and manufacturer's recommendations for proportioning mixes, installation of strips, and for preparation, placing, curing, grinding, grouting, finishing, and all other repair and restoration operations required.
- B. Install divider and accessory strips where required and to replace damaged or deteriorated existing strips in areas of repair and restoration. Place in an adhesive setting bed, in accordance with manufacturer's instructions and without voids below strips. Provide mechanical anchorage as required for adequate attachment of strips to substrate.
- C. Provide control joints and expansion joints where required and to replace damaged or deteriorated existing strips in areas of repair and restoration, by installing angle-type divider strips back-to-back with filler cemented between strips, flush with finish floor.
- D. Provide new cementitious underbed as required in areas of repair and restoration; comply with NTMA "Guide Specification for Bonded Terrazzo". Prepare sub-slab surfaces if required to insure positive bonding with underbed. Thoroughly clean areas of foreign matter immediately before placing underbed.
- E. Exercise extreme care to ensure fluids from grinding operation do not react with divider or control strips to produce a stain on aggregate.
- F. Joint sealants and installation are specified in Division 07.
- 3.2 CLEANING AND REFINISHING EXISTING TERRAZZO
 - A. Clean and refinish existing terrazzo to restore the original finish before patching existing terrazzo to allow for a close color match of patched areas to existing.
 - B. Cleaning and Sealing:
 - 1. Thoroughly wash all surfaces with a neutral cleaner; follow by rinsing with clean water and allow to dry thoroughly.
 - 2. Apply one coat of sealer, acrylic type, as per manufacturer's directions.
 - C. Protection: Protect the finished terrazzo surfaces from all trades that will follow.
- 3.3 PATCHING EXISTING TERRAZZO
 - A. Preparation:

- 1. Prepare void to receive new terrazzo by cutting perimeter of the void perpendicular to the surface to create vertical edges on the existing surrounding terrazzo. If the patch is of a small size, 6" square or less, slightly undercut at the base of this edge.
- 2. Remove all foreign matter from the surface and saturate void with ample water to avoid quick surface drying. If the water does not penetrate into the surface, the substrate shall be further prepared to remove the foreign matter and allow for a proper bond.
- 3. Apply cement paste to the substrate and vertical edges and scrub into the surface. Do not allow cement paste to dry before placing terrazzo composition.
- 4. Color Matching: Do not patch existing floors until cleaning and refinishing has been completed in area of patch to ensure new terrazzo material matches existing to the greatest extent possible. Predetermine color of existing marble chips and matrix before attempting any patching work; modify as necessary by substituting to achieve close match to existing terrazzo. Do not use any mixtures that have not been approved by Architect.
- B. Placement:
 - 1. Mixture: Two parts of blended marble chips to one part of portland cement; add enough water to make the mix plastic.
 - 2. Place mixture in void and level with a trowel. Seed additional marble chips of the same blend over the patch. Compact and extract all excess cement and water from this mixture.
- C. Curing: Cover with polyethylene sheeting to prevent quick hydration.
- D. Finishing:
 - 1. Initial Grinding: Use a #40 or finer grit stone, exposing the marble chips. Pass fine #80 grit stone before grouting with cement to fill all pinholes. Cover grouted surface with polyethylene for at least 72 hours.
 - 2. Final Grinding: Use a #80 or finer grit stone. Take care to limit the grinding and polishing to a limited distance beyond the perimeter of the patched area, resulting in a neat workmanlike appearance. Patch shall blend with existing floor to the greatest extent possible. Seal the patch with a penetrating-type terrazzo sealer according to manufacturer's directions.

3.4 REPAIRING SMALL HOLES AND SPALLS

- A. General: Repair small holes and spalls in existing terrazzo using epoxy or polyester resin materials where use of cementitious terrazzo is not feasible.
- B. Remove all foreign matter from the void. Remove all sealer from the surface adjacent to the void with a stripper or ammonia.
- C. Blend epoxy or polyester resin materials to match color matrix of existing terrazzo by adding colored marble dust or pigment.

- D. Force mixed resin into the void, making sure it is pressured into the void as deep as possible. Use a substrate primer if so recommended by matrix manufacturer.
- E. If the void is large enough, place marble chips of same blend as the existing floor in the void approximately one to two inches on center; apply while patching resin is still in a wet state and press into wet matrix.
- F. Tool off surface of repaired area, cover with polyethylene and allow to cure.
- G. When material has hardened, sand surface with a hand sander or small grinding equipment, using fine stones. Take care to limit the grinding and polishing to a limited distance beyond the perimeter of the patched area, resulting in a neat workmanlike appearance. Patch shall blend with existing floor to the greatest extent possible. Seal the patch with a penetrating-type terrazzo sealer according to manufacturer's directions.

3.5 ADJUSTING, CLEANING AND PROTECTION

- A. Defective Work: Any terrazzo work that does not match approved mock-up and/or does not result in a consistent appearance with adjacent terrazzo surfaces shall be considered defective. The Contractor shall correct all defective areas to the satisfaction of the Architect at no additional cost to the Owner.
- B. Protection: Protect terrazzo from damage and wear during construction operation.
- C. Final Cleaning: Clean terrazzo as recommended by manufacturer of sealer and machine buff if required when building is ready for occupancy.

SECTION 096813 - TILE CARPETING

- PART 1 GENERAL
- 1.1 SUMMARY
 - A. Section includes:
 - 1. Modular carpet tile
 - B. Related Requirements:
 - 1. Division 09 Section "Resilient Flooring and Accessories" for resilient wall base, stair nosing and accessories installed with carpet tile.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site
 - 1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
 - a. Review delivery, storage, and handling procedures.
 - b. Review ambient conditions and ventilation procedures.
 - c. Review subfloor preparation procedures.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include installation recommendations for each type of substrate.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation.
 - 5. Pattern of installation.
 - 6. Pattern type, location, and direction.
 - 7. Pile direction.
 - 8. Type, color, and location of insets and borders.
 - 9. Type, color, and location of edge, transition, and other accessory strips.
 - 10. Transition details to other flooring materials.

- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For Installer.
 - B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.
 - C. Sample Warranty: For special warranty.
- 1.5 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.
- 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. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m).
- 1.7 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. Performance Characteristics of Carpet Tile: Provide carpet tile identical to that tested for the following performance characteristics, per test methods indicated:
 - 1. Flammability: Passes DOC FF 1-70 Pill Test.
 - 2. Flame Spread: Meets NFPA Class 1 when tested under ASTM E-648 Glue Down.

- 3. Smoke Density: 450 or less, Flaming Mode when tested under NBS Smoke Chamber NFPA-258.
- 4. Static: No more than 3.5 KV when tested under AATCC-134.
- 5. Specific Optical Density: Not more than 300 in first 4 minutes tested in flaming or non-flaming mode when tested under ASTM E662.
- 6. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E 648 or NFPA 253.
- C. Mockups: Before installing carpet tile, install mockups for each type of carpet tile installation required to demonstrate aesthetic effects and qualities of materials and execution. Install mockups to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Install mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect seven days in advance of dates and times when mockups will be installed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before starting work.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Remove mockups when directed.
 - 7. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI Carpet Installation Standard 2011.
- B. Store carpeting per manufacturer's recommendations for allowable temperature and humidity range. Products shall not be allowed to become damp.
- C. Remove carpeting from packaging and store in unoccupied, ventilated areas (100% outside air supply, minimum of 1.5 air changes per hour, no recirculation) for 24-72 hours prior to installation. Carpeting shall not be stored with materials which have high emissions of VOCs or other contaminants. Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paint, wood preservatives, and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders

1.9 FIELD CONDITIONS

- A. Comply with CRI Carpet Installation Standard 2011 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.

1.10 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, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: Lifetime.

PART 2 - PRODUCTS

- 2.1 CARPET TILE
 - A. Manufacturers: Provide specified Basis of Design products or equal manufactured by one of the following manufacturers:
 - 1. Interface
 - 2. Mannington
 - 3. Milikin
 - 4. Mohawk Commercial Carpet
 - 5. Shaw
 - 6. Tarkett
 - B. Sustainable Carpet Certification: Provide carpet tile that has a NSF/ANSI 140 rating of Gold or better.
 - C. Emissions: Provide carpet tile that complies with testing and product requirements of Carpet and Rug Institute's "Green Label Plus" program.
 - D. Carpet Tile CP1:
 - 1. Construction: Tufted pattern loop
 - 2. Yarn System: Post-Consumer Content Nylon
 - 3. Yarn Manufacturer: Universal
 - 4. Soil Release Technology: Protekt²

- 5. Stain Protection: Intersept
- 6. Dye Method: 100% solution dyed
- 7. Face Weight: 16 oz. per square yard.
- 8. Machine Gage: 1/10 in.
- 9. Pile Height: 0.11 in.
- 10. Total Thickness: 0.062 in.
- 11. Average Density: 9,290
- 12. Stitches per Inch: 12.0
- 13. Backing: GlasBac
- 14. Size: 9.845 in x 39.38 in (25cm x 1m)
- 15. Guarantees: 15 Year Standard Carpet Waranty.
- 16. Basis of Design Product: SS217 from Street Smart Collection by Interface Commercial Carpet, or equal.
- 17. Color: 105012 Sidewalk
- 18. Installation Method: Ashlar.
- 19. Location: Library
- E. Carpet Tile CP1A:
 - 1. Construction: Tufted pattern loop
 - 2. Yarn System: Post-Consumer Content Nylon
 - 3. Yarn Manufacturer: Universal
 - 4. Soil Release Technology: Protekt²
 - 5. Stain Protection: Intersept
 - 6. Dye Method: 100% solution dyed
 - 7. Face Weight: 16 oz. per square yard.
 - 8. Machine Gage: 1/10 in.
 - 9. Pile Height: 0.11 in.
 - 10. Total Thickness: 0.062 in.
 - 11. Average Density: 9,290
 - 12. Stitches per Inch: 12.0
 - 13. Backing: GlasBac
 - 14. Size: 9.845 in x 39.38 in (25cm x 1m)
 - 15. Guarantees: 15 Year Standard Carpet Warranty.
 - 16. Basis of Design Product: SS218 from Street Smart Collection by Interface Commercial Carpet, or equal.
 - 17. Color: 105023 Back Street/Naranja
 - 18. Installation Method: Ashlar.
 - 19. Location: Library
- F. Carpet Tile CP2:
 - 1. Construction: Multi-level pattern loop
 - 2. Fiber Content: eco solution q Nylon
 - 3. Soil/Stain Protection: ssp shaw soil protection
 - 4. Dye Method: 100% solution dyed
 - 5. Face Weight: 18 oz. per square yard.
 - 6. Machine Gage: 1/12 in.
 - 7. Pile Height: 0.090 in.
 - 8. Total Thickness: 0.220 in.

- 9. Average Density: 7200
- 10. Stitches per Inch: 10.5
- 11. Primary Backing: Synthetic
- 12. Secondary Backing: ecoworx tile
- 13. Size: 24 in x 24 in
- 14. Guarantees: Lifetime for wear, static, edge ravel, delamination, tuft bind, stain, backing material.
- 15. Basis of Design Product: Shaw "Color Frame Tile" Style 5T081, Color Frame + Color Form Collection.
- 16. Color: Blaze 81668.
- 17. Installation: Monolithic.
- 18. Location: Where scheduled.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cementbased formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, 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.
- C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.
- D. Carpet Edge Guard: Refer to Division 09 Section "Resilient Flooring and Accessories."
- E. Resilient Stair Nosing: Refer to Division 09 Section "Resilient Flooring and Accessories."

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. Do not install flooring if subfloor moisture emission rate exceeds indicated amounts.

- a. Calcium Chloride Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed the maximum moisture-vapor-emission rate acceptable to flooring manufacturer.
- b. Moisture Meter Testing: Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have relative humidity level measurement acceptable to flooring material manufacturer.
- c. Testing Procedures
 - Where flooring is indicated to be applied to structural concrete topping or concrete slab-on-grade substrates, perform moisture meter tests.
 - 2) Where flooring is indicated to be applied to areas where hydraulic cement topping is installed, perform calcium chloride or moisture meter tests as required by topping manufacturer.
- 2. Subfloor finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" for slabs receiving carpet tile.
- 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI Carpet Installation Standard 2011, Section 7, "Site Conditions; All Installations," 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 (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.
- 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. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.
- 3.3 INSTALLATION
 - A. General: Comply with CRI Carpet Installation Standard 2011, Section 18, "Modular Carpet," and with carpet tile manufacturer's written installation instructions.

- B. Maintain dye lot integrity. Do not mix dye lots in same area.
- C. 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.
- D. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. 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.
- F. Install pattern parallel to walls and borders, unless otherwise indicated.
- 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 Carpet Installation Standard 2011, Section 20, "Protecting Indoor Installations."
 - 1. Restrict traffic over adhesive installations for a minimum of 48 hours to allow proper adhesive cure.
 - 2. Restrict exposure to water from cleaning or other sources for a minimum of 30 days.
 - 3. If required to protect the finished floor covering from dirt or paint, or if additional work is to be done after the installation, cover carpeting with a non-staining building material paper.
 - 4. Protect the installation from rolling traffic by using sheets of hardboard or plywood in affected areas.
 - 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 096813

SECTION 097719 - WOOD VENEER WALL PANEL SYSTEM

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes adhered decorative wood veneer faced fiberboard wall panel system for cladding walls.
- 1.2 ACTION SUBMITTALS
 - A. Product data for each type of product specified. Include data on physical characteristics, durability, fade resistance, and flame resistance characteristics.
 - B. Shop Drawings: Submit elevations of each wall showing layout of individual wall panels and trim members, demonstrating decorative pattern, if any.
 - C. Samples for verification purposes of each type and color of wood veneer wall panels and molding accessory required of size indicated below:
 - 1. 6 inch square panel sample of each wood species, cut and finish specified.
 - 2. 6-inch long sample of each molding accessory.

1.3 INFORMATIONAL SUBMITTALS

- A. Installer qualifications.
- B. Product certificates signed by wood veneer faced wall panel manufacturer certifying materials furnished comply with specified requirements.
- C. Certified test reports showing compliance with requirements for fire performance characteristics and physical properties.
- D. Maintenance data for inclusion in Division 01 Section "Closeout Procedures." Include the following:
 - 1. Methods for maintaining wood veneer faced wall panels.
 - 2. Precautions for use of cleaning materials and methods that could be detrimental to finishes and performance.

1.4 QUALITY ASSURANCE

A. Fire Performance Characteristics: Provide wood veneer faced wall panels with the following surface burning characteristics as determined by testing identical products per ASTM E 84 by UL or other testing and inspecting organizations acceptable to authorities

having jurisdiction. Identify wood veneer faced wall panels with appropriate markings of applicable testing and inspecting organization.

- 1. Class A:
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 450 or less.
- B. Installer Qualifications: Arrange for installation of wood veneer faced wall panels by a firm that can demonstrate successful experience in installing similar in type and quality to those required for this Project.
- C. In-Place Mock-up: Prepare mock-ups of types indicated below following requirements of this section. Reprepare mock-ups as many times as required by Architect until satisfactory result is obtained, as judged solely by Architect. Obtain Architect's approval of visual qualities before proceeding with work. Protect approved mock-ups until all work has been completed. Approved mock-ups will represent the minimum standard of acceptability for each portion of the work.
 - 1. Provide in-place sample minimum 5' x 5' of typical wall panel system layout, including all trim at edges, in location directed by Architect.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Protect units during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
 - B. Store panels under environmental conditions recommended by wall panel manufacturer.
- 1.6 PROJECT CONDITIONS
 - A. Maintain a constant temperature of 60° to 80° F and 35% to 55% humidity in installation location for 72 hours before and during installation.
 - B. Field Measurements: Where units are indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of Work.

PART 2 - PRODUCTS

- 2.1 WOOD VENEER FACED WALL PANELS
 - A. Wood Veneer Faced Wall Panels: Select AA grade quality wood veneer laminated to wood fiber substrate and coated with furniture grade catalyzed finish as protective topcoat.
 - 1. Wood Veneer Species and Cut: Maple, plain sliced

- 2. Wood Fiber Substrate: Medium density wood fiberboard conforming to ANSI A208.2, industrial-grade MDF and having no added formaldehyde.
- 3. Veneer Face: 0.010 to 0.015 inches with catalyzed finish of approximately 0.003 inches.
- 4. Balancing Backer: Wood veneer measuring between 0.015 and 0.025 inches.
- 5. Panel Size(s): As indicated on Drawings.
- 6. Panel Thickness: ¹/₂"
- 7. Panel Edges: Tongue and groove, with 1/4"square reveal
- 8. Grain Direction:Horizontal
- 9. Matching Between Panels: Manufacturer's standard non-sequenced matching.
- 10. Flame Spread : ASTM E84 Class A
- 11. Finish: Classic Clear Topcoat.
- 12. Basis of Design Product: Modules Ship-Lap Wall System by Marlite, Inc., or equal.

2.2 ACCESSORIES

- A. Panel Trim: Aluminum profiles in 10 foot lengths, fabricated from extruded aluminum 6063-T5 alloy and factory prefinished, provided by panel manufacturer as part of the wall panel system.
 - 1. Finish: Black satin anodized
 - 2. Edge and Inside Corner: Marlite Inc., Model # MT-570
 - 3. Outside Corner: Marlite Inc., Model # MT-560
 - 4. Base Trim: Marlite Inc., Model # S612-2

2.3 INSTALLATION MATERIALS

- A. Adhesive: Manufacturer's standard low odor, VOC compliant, non-flammable latex based adhesive for use and substrate.
- B. Sealant: Manufacturer's standard clear silicone sealant meeting local VOC requirements.

2.4 PANEL FABRICATION

- A. Wood veneer wall panels and accessories shall be factory finished and ready to install except for field fabrication as required at work site and perimeter conditions.
 - 1. Refinish field cut panel edges in accordance with manufacturer's instruction before installation.
 - 2. Drill corners for cut-outs 1/8 inch radius minimum.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting installation and performance of wood veneer faced wall panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Acclimate panels to room temperature for 72 hours prior to installation.
- C. Follow manufacturer's printed instructions for surface preparation.

3.3 INSTALLATION

- A. Do not use materials that are unsound, warped, bowed or twisted.
- B. Install wood veneer faced wall panels plumb, level, true, and aligned with adjacent materials.
 - 1. Scribe and cut panels to fit adjoining work.
 - 2. Install to tolerance of 1/32 inch in 8 feet for plumb and level.
 - 3. Coordinate with materials and systems that may be in or adjacent to panels. Provide cutouts for mechanical and electrical items that penetrate.
- C. Plan wood veneer faced wall panel layout, balancing panel sizes at corners.
 - 1. Examine panels and arrange to achieve best combination of color, pattern, texture and grain.
 - 2. Comply with decorative layout of panels as per approved shop drawings.
 - 3. Adhere panels to substrate in accordance with manufacturer's written instructions.
 - 4. Provide moldings at all sides of panels.
 - 5. Remove excess sealant from panel surfaces immediately.
- D. Completed installation shall match approved mock-up.

3.4 ADJUSTING AND CLEANING

- A. Repair damaged or defective wood veneer faced wall panels where possible to eliminate functional or visual defects. Where not possible to repair, replace wood veneer faced wall panels.
- B. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces.
- C. Use cleaning methods recommended by the wood veneer faced wall panel manufacturer.
- D. Replace panels that cannot be cleaned.

3.5 PROTECTION

A. Provide final protection and maintain conditions that ensure panels are without damage or deterioration at time of Substantial Completion.

END OF SECTION 097719

SECTION 099100 - PAINTING

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes surface preparation and the application of paint and stain systems on the following interior and exterior substrates:
 - 1. Steel and iron.
 - 2. Galvanized metal.
 - 3. Gypsum board.
 - 4. Plaster
 - 5. Wood
 - B. Related Sections include the following:
 - 1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product indicated.
 - B. Samples for Initial Selection: For each type of topcoat product indicated.
 - C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) 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.
 - D. 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. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Maintenance Data: Provide paint codes for all colors and paint materials provided on the Project, to accommodate color matching for maintenance stock of paint.

1.4 QUALITY ASSURANCE

- A. MPI Standards: Maintain copy of this standard at the Project site at all times.
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
 - 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.
- B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected 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 paint 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. Apply benchmark samples after permanent lighting and other environmental services have been activated.
 - 3. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 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 (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Co.
 - 2. PPG Architectural Finishes, Inc.
 - 3. Sherwin-Williams Company (The).
 - 4. Tnemec

2.2 PAINT, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint 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 paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)and the OTC (Ozone Transport Commission) restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:
 - 1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
 - 2. Nonflat Paints, Coatings, and Primers: VOC content of not more than 150 g/L.
 - 3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
 - 4. Floor Coatings: VOC not more than 100 g/L.
 - 5. Shellacs, Clear: VOC not more than 730 g/L.
 - 6. Shellacs, Pigmented: VOC not more than 550 g/L.
 - 7. Flat Topcoat Paints: VOC content of not more than 50 g/L.
 - 8. Nonflat Topcoat Paints: VOC content of not more than 150 g/L.
 - 9. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
 - 10. Floor Coatings: VOC not more than 100 g/L.
 - 11. Shellacs, Clear: VOC not more than 730 g/L.
 - 12. Shellacs, Pigmented: VOC not more than 550 g/L.
 - 13. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
 - 14. Dry-Fog Coatings: VOC content of not more than 400 g/L.
 - 15. Zinc-Rich Industrial Maintenance Primers: VOC content of not more than 340 g/L.
 - 16. Pre-Treatment Wash Primers: VOC content of not more than 420 g/L.
 - 17. Fire Retardant Paint: VOC content of not more than 60 g/L.
- C. Colors: Four colors as selected by Architect, plus black and white.

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 work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Gypsum Board: 12 percent.
 - 2. Plaster: 12 percent
 - 3. Wood: 15 percent
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that 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 if any.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
- E. Galvanized-Metal Substrates: 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.

- F. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- G. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - 1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - 2. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - 3. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
 - 4. When transparent finish is required, backprime with spar varnish or polyurethane.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint 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 front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- B. Application Procedures: Apply paints and coatings by brush or roller according to the manufacturer's directions, except s noted below. Spray application is not permitted for trim, ceilings and walls, unless specifically approved by Architect in advance for each individual situation. Roller application on woodwork is not permitted.
 - 1. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
 - 2. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.
 - 3. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
- C. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- D. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

- E. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- F. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- G. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:
 - 1. Mechanical Work:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Tanks that do not have factory-applied final finishes.
 - e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
 - f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
 - 2. Electrical Work:
 - a. Switchgear.
 - b. Panelboards.
 - c. Electrical equipment that is indicated to have a factory-primed finish for field painting.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.
- 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 paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, 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 painted surfaces.
- 3.6 EXTERIOR PAINTING SCHEDULE
 - A. General: Provide listed products or equal products of other named manufacturers in Part 2.
 - B. Steel and Iron Substrates: Polyurethane, Pigmented, Epoxy Zinc Rich Primer and High-Build Epoxy Coating System: Gloss or Semi-Gloss as selected by the Architect.
 - 1. Prime Coat: Epoxy Zinc Rich Primer. Tnemec: Tneme-Zinc Series 90-97 or equal.
 - 2. Intermediate Coat: High-performance, polyamide-epoxy coating; High-Build Epoxy Marine Coating, Low Gloss: Tnemec: Hi-Build Epoxoline, Series 66, tinted slightly lighter than top coat., or equal
 - 3. Topcoat (Gloss)t: Aliphatic Acrylic Polyurethane, Two-Component, Pigmented, Gloss: Tnemec Endura-Shield II Series 1074.
 - 4. Topcoat (Semi-Gloss)t: Aliphatic Acrylic Polyurethane, Two-Component, Pigmented, Semi-Gloss: Tnemec Endura-Shield II Series 1075.
 - C. Zinc-Coated (Galvanized) Metal: Full-gloss, acrylic latex enamel finish 2 coats selfpriming.
 - 1. Prime Coat: Gloss acrylic latex enamel paint; MPI # 114, X-Green 114, 154, X-Green 154, 164, LEED 2009, LEED V4.
 - a. Benjamin Moore Ultra Spec D.T.M. Acrylic Gloss Enamel HP28
 - 2. Top Coat: Gloss acrylic latex enamel paint; MPI # 114, X-Green 114, 154, X-Green 154, 164, LEED 2009, LEED V4.
 - a. Benjamin Moore Ultra Spec D.T.M. Acrylic Gloss Enamel HP28
 - D. Steel Lintels: Epoxy Mastic Primer and Polyurethane TopCoat Coating System: Gloss.
 - 1. Prime Coat: Epoxy mastic primer; Pittguard 95-245 Series Rapid-Coat DTR Epoxy Mastic Coating by PPG or equal
 - 2. Topcoat (Gloss): Two component gloss acrylic aliphatic urethane; Pitthane Ultra 95-812 Series by PPG or equal.
- 3.7 INTERIOR PAINTING SCHEDULE

- A. General: Provide listed products or equal products of other named manufacturers in Part
 2.
- B. Gypsum Board and Plaster Ceilings: Eggshell acrylic finish.
 - 1. Prime Coat: Latex-based, interior primer; MPI # 50, X-Green 50, 149, X-Green 149, LEED 2009, LEED V4, CHPS Certified.
 - a. Benjamin Moore; Ultra Spec 500 Interior Latex Primer N534
 - 2. Intermediate Coat and Topcoat: Low-luster (eggshell or satin), acrylic-latex, interior enamel; MPI # 52, X-Green 52, 145, X-Green 145, 139, X-Green 139, LEED 2009 LEED V4, CHPS Certified.
 - a. Benjamin Moore; Ultra Spec 500 Interior Latex Eggshell N538.
- C. Gypsum Drywall and Plaster Walls: Semi-gloss, acrylic finish.
 - 1. Prime Coat: Latex-based, interior primer; MPI # 50, X-Green 50, 149, X-Green 149, LEED 2009, LEED V4, CHPS Certified.
 - a. Benjamin Moore; Ultra Spec 500 Interior Latex Primer N534
 - Intermediate Coat and Topcoat: Semigloss acrylic-latex, interior enamel; MPI # 43, X-Green 43, 146, X-Green 146, 140, X-Green 140, LEED 2009, LEED V4, CHPS Certified.
 - a. Benjamin Moore; Ultra Spec 500 Latex Semigloss N539.
- D. Hollow Metal Doors, Frames, and Sidelights, and Ferrous Metals: Semigloss, acrylicenamel finish.
 - 1. Prime Coat: Rust-Inhibitive Primer (Water Based), MPI #107, X-Green 107, 134, LEED 2009, CHPS Certified.
 - a. Benjamin Moore; Super Spec HP Acrylic Metal Primer P04.
 - 2. Intermediate Coat and Topcoat: Factory-formulated semigloss acrylic-latex enamel for interior application; MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.
 - a. Benjamin Moore; Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel, HP29
- E. Painted Woodwork: Semigloss, acrylic finish.
 - 1. Prime Coat: Latex-based, interior primer; MPI # 50, X-Green 50, 149, X-Green 149, LEED 2009, LEED V4, CHPS Certified.
 - a. Benjamin Moore; Ultra Spec 500 Interior Latex Primer N534
 - Intermediate Coat and Topcoat: Semigloss acrylic-latex, interior enamel; MPI # 43, X-Green 43, 146, X-Green 146, 140, X-Green 140, LEED 2009, LEED V4, CHPS Certified.
 - a. Benjamin Moore; Ultra Spec 500 Latex Semigloss N539.
- F. Stained Wood and Woodwork: Satin, waterborne clear acrylic urethane over stain.

- 1. Stain Coat: Penetrating wood stain, water-based; MPI # 186 LEED Credit.
 - a. Lenmar (Benjamin Moore); Waterborne Interior Wiping Stain 1WB.1300 (240 g/L)
- 2. Intermediate Coat and Topcoat: Satin, interior waterborne clear acrylic urethane varnish; MPI # 121, 128.
 - a. Lenmar (Benjamin Moore); Waterborne Aqua-Plastic Urethane Satin, 1WB.1427 (335 g/L)
- G. Natural-Finish Wood and Woodwork: Satin, waterborne clear acrylic urethane.
 - 1. Three Finish Coats: Satin, interior waterborne clear acrylic urethane varnish; MPI # 121, 128.
 - a. Lenmar (Benjamin Moore); Waterborne Aqua-Plastic Urethane Satin, 1WB.1427 (335 g/L).

END OF SECTION 099100

SECTION 101000 - VISUAL DISPLAY SURFACES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following types of visual display boards:
 - 1. Glass marker board, magnetic

1.2 ACTION SUBMITTALS

- A. Product Data: Provide manufacturer's product data for each type of visual display board specified.
- B. Shop Drawings: For each type of visual display board required, including dimensioned elevations. Show location of joints between individual panels where unit dimensions exceed maximum panel length. Include sections of typical trim members. Show anchors, grounds, reinforcement, accessories, layout, and installation details.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain visual display boards through one source from a single manufacturer.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Glass Markerboards:
 - a. Krystal
 - b. Quartet.
 - c. Egan Visual
 - d. Clarus Glassboards

2.2 MATERIALS, GENERAL

- A. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Wood Glues: 30 g/L.
 - 2. Contact Adhesive: 80 g/L

2.3 GLASS MARKERBOARD

- A. Provide frameless, glass markerboards fabricated from 1/4" thick, fully tempered glass, backcoated with color coating, and with steel backing. Include aluminum marker tray, minimum two high power glass board magnets, and all mounting hardware (pass-through, standoff type) for each markerboard provided.
 - 1. Color: White
 - 2. Basis of Design Product: Quartet Infinity glass markerboards by Quartet or equal.
 - 3. Sizes: As indicated on Drawings.

2.4 ACCESSORIES

- A. Metal Trim and Accessories: Fabricate frames and trim of not less than 0.062-inch- (1.57-mm-) thick, extruded-aluminum alloy, size and shape as indicated, to suit type of installation. Provide straight, single-length units. Keep joints to a minimum. Miter corners to a neat, hairline closure.
 - 1. Where size of visual display boards or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by the Architect from manufacturer's standard structural support accessories to suit conditions indicated.

2.5 FABRICATION

A. Assembly: Provide factory-assembled markerboard units in single units without joints.

2.6 FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.
- C. Class II Clear Anodized Finish: AA-M12C22A31 (Mechanical Finish: as fabricated, nonspecular; Chemical Finish: etched, medium matte; Anodic Coating: Class II Architectural, clear film thicker than 0.4 mil).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine wall surfaces, with Installer present, for compliance with requirements and other conditions affecting installation of visual display boards.

- 1. Surfaces to receive markerboards shall be free of dirt, scaling paint, and projections or depressions that would affect smooth, finished surfaces of markerboards.
- 2. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. A.Install units in locations and at mounting heights as indicated on drawings; comply with manufacturer's installation instructions. Keep perimeter lines straight, plumb, and level. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for a complete installation.
- B. Coordinate Project-site-assembled units with grounds, trim, and accessories. Join parts with a neat, precision fit.

3.3 ADJUST AND CLEAN

- A. Verify that accessories required for each unit have been properly installed and that operating units function properly.
- B. Clean units in accordance with the manufacturer's instructions. Break in markerboards only as recommended by the manufacturer.

END OF SECTION 101000

SECTION 122413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes
 - 1. Manual operation light filtering shades.
 - 2. Manual operation black-out shades.
 - 3. Motor operation black-out shades.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
 - 1. Motorized Shade Operators: Include operating instructions.
 - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements
 - 3. Motor controllers.
- B. Shop Drawings: Show location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other Work, operational clearances, and relationship to adjoining work.
 - 1. Motorized Shade Operators: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
 - 2. Wiring Diagrams: Power, system, and control wiring.
- C. Samples for Verification:
 - 1. Shade Material: Not less than 12-inch- (300-mm-) square section of fabric for each type, from dye lot used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of material.
- D. Window Treatment Schedule: Include roller shades in schedule using same room designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

- A. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining roller shades and finishes.

- 2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
- 3. Operating hardware.
- 4. Motorized shade operator.
- 5. Motor controllers.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed installation of roller shades similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance
- B. Source Limitations: Obtain roller shades through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Resistance Ratings: Passes NFPA 701.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Build mockups of in-place full-size window shade unit in the location as directed by Architect.
 - 2. Provide one mock-up for each type of window shade fabric provided in the Work.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in a window treatment schedule.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate

measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range.

- 1.7 WARRANTY
 - A. Roller Shade Hardware, and Shadecloth: Manufacturer's standard non-depreciating twenty-five year limited warranty.
 - B. Roller Shade Motors and Motor Control Systems: Manufacturer's standard nondepreciating five-year warranty

PART 2 - PRODUCTS MANUFACTURERS

- A. Basis of Design Manufacturer: Provide specified shade systems by MechoShade System, Inc. or equivalent by one of the following:
 - 1. Draper Shade & Screen Co., Inc.
 - 2. Hunter Douglas Window Fashions.
 - 3. Levolor Contract; a Newell Company; Joanna
 - 4. Silent Gliss USA, Inc
- 2.2 BASIS OF DESIGN PRODUCTS
 - A. Manual Single-Roll Shades: Provide Classic Mecho/5 Manual System by MechoShade or equal.
 - B. Motorized Single-Roll Shades: Provide ElectroShade Single Shade System by MechoShade or equal.
- 2.3 MATERIALS
 - A. Room Darkening Fabric, Opaque Type (SH1): Room darkening washable and colorfast, 50% acrylic coating and 50% polyester, "Chelsea Blackout 250" Series by MechoShade, or equal.
 - 1. Color: 0254 Shale
 - 2. Location: Interior at Library and at Breakout Rooms.
 - B. Glare Control Fabric, 3% Open Mesh Type (SH2): 100% thermoplastic olefin (TPO) basket-weave design; "EcoVeil 1550" Series by MechoShade, or equal.
 - 1. Color: 1563 Grey.
 - 2. Location: Cafe.
 - C. Brackets: Plated steel, with adequate projection to clear all window fixtures

D. Aluminum Extrusions: Alloy and temper recommended by manufacturer for use intended and as required for proper application of finish indicated but not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.

2.4 FABRICATION

- A. Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade
- B. Components: Noncorrosive, self-lubricating materials.
- C. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with manufacturer's standard method for attaching shade material.
- D. Direction of Roll: Regular, from back of roller.
- E. Mounting Brackets:
 - 1. Single Roll Shades: Galvanized or zinc-plated steel, style for between jamb mounting unless otherwise indicated.
- F. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as required for between the jambs mounting; removable design for access
- G. Bottom Bar: Steel or extruded aluminum, with plastic or metal capped ends. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
- H. Manual Shade Operation: Bead chain clutch operator.
 - 1. Bead Chain Material: #10 stainless steel chain with 120 lb. breaking strength.
 - 2. Operator Location: On left or right side of shade as directed by Architect for each location.
- I. Shade Units: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
 - 1. Shade Units Installed between (Inside) Jambs: Edge of shade not more than 1/4 inch (6 mm) from face of jamb. Length equal to head to sill dimension of opening in which each shade is installed.
 - 2. Shade Units Installed Outside Jambs: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

- J. Installation Fasteners: Fabricated from metal that is noncorrosive to shade hardware and adjoining construction and to support shades as required by manufacturer's written instructions.
- K. Color-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
- L. Colors of Metal and Plastic Components Exposed to View: As selected by Architect from manufacturer's full range unless otherwise indicated.

2.5 MOTORIZED ROLLER SHADE OPERATORS

- A. General: Provide factory-assembled motorized shade operation systems designed for lifting shades of type, size, weight, construction, use, and operation frequency indicated. Provide operation systems of size and capacity and with features, characteristics, and accessories suitable for Project conditions and recommended by shade manufacturer, complete with electric motors and factory-prewired motor controls, remote-control stations, remote-control devices, power disconnect switches, enclosures protecting controls and all operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with the building electrical system.
- B. Comply with NFPA 70.
- C. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6 with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc
- D. Electric Motors: UL-approved or -recognized, asynchronous, totally enclosed, insulated, capacitor-start motors, complying with NEMA MG 1, with thermal overload protection, brake, permanently lubricated bearings, and limit switches; sized by shade manufacturer to start and operate size and weight of shade considering service factor or considering Project's service conditions without exceeding nameplate ratings.
 - 1. Service Factor: According to NEMA MG 1, unless otherwise indicated.
 - 2. Motor Characteristics: Integral low voltage 24 VDC motor powered by a low voltage power supply connection equipped with a disconnedt plug assembly furnished with EDU.
 - 3. Motor Mounting: Within manufacturer's standard roller enclosure.
 - 4. Basis of Design Product: Whisper-Shade IQ2DC Electronic Drive Unit (EDU) Low Voltage by MechoShade.
- E. Motor Control System: Shades shall be operated by a control panel on the wall; location as indicated.
- F. Remote Controls: Electric controls with NEMA ICS 6, Type 1 enclosure for recessed or flush mounting. Provide the following devices for remote-control activation of shades:

- 1. Control Stations: Button-operated wall-mounted controls to provide simultaneous raising and lowering of gangs of shades
 - a. Color: As selected by Architect.
- 2. Connect local wall switches to motor control system.
- G. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop shade at fully raised and fully lowered positions.
- H. Operating Function: Stop and hold shade at any position.

PART 3 - EXECUTION

- 3.1 EXAMINATION
 - A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected
- 3.2 ROLLER SHADE INSTALLATION
 - A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow clearances for window operation hardware.
 - B. Install metal parts isolated from concrete or mortar to prevent corrosion.
 - C. Install mounting brackets with not less than 2 fasteners per bracket.
 - D. Connections: Connect motorized operators to building electrical system

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. Startup Services: Engage a factory-authorized service representative to perform startup services on motor control system and to train Owner's maintenance personnel as specified below:
 - 1. Test and adjust controls and procedures of operation. Replace damaged and malfunctioning controls and equipment.
 - 2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, reprogramming, and procedures for testing and resetting motor control system.
 - 3. Schedule training with Owner with at least 7 days' advance notice.

3.6 SHADE SCHEDULE

- A. Manual Operated Single Shade: Provide at café and interior library locations.
- B. Motor Operated Single Shades: Provide at break-out rooms in library.

END OF SECTION 122413

SECTION 123661 - SIMULATED STONE COUNTERTOPS

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes manufactured composite stone countertops.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For the following:
 - 1. Each variety of composite stone
 - 2. Stone accessories and other manufactured products.
 - B. Shop Drawings: Include plans, sections, details, and attachments to other work.
 - C. Samples for Verification: For each composite stone color and pattern indicated, in sets of samples not less than 12 inches (300 mm) square. Include two or more Samples in each set and show the full range of variations in appearance characteristics expected in completed Work.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For fabricator.
 - B. Sealant Compatibility Test Report: From sealant manufacturer, complying with requirements in Division 07 Section "Joint Sealants" and indicating that sealants will not stain or damage stone.
 - C. Maintenance Data: For composite stone countertops to include in maintenance manuals. Include Product Data for stone-care products used or recommended by Installer, and names, addresses, and telephone numbers of local sources for products.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate composite stone countertops similar to that indicated for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of products.
- C. Source Limitations: Obtain each variety of composite stone from a single manufacturer with resources to provide materials of consistent quality in appearance and physical properties.
- 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store composite stone on wood A-frames or pallets with nonstaining separators and nonstaining, waterproof covers. Ventilate under covers to prevent condensation.
- 1.6 PROJECT CONDITIONS
 - A. Field Measurements: Verify dimensions of construction to receive composite stone countertops by field measurements before fabrication

PART 2 - PRODUCTS

2.1 COMPOSITE STONE

- A. Composite Stone Material: Composite material of natural quartz, polymer resins and pigments.
 - 1. Basis of Design Product: DuPont Corian Quartz or equal by one of the following:
 - a. ColorQuartz
 - b. Cosentino
 - c. Wilsonart
 - 2. Thickness: 2 cm
 - 3. Color(s): Stratus White.
 - 4. Finish: Polished.
 - 5. Edges: Eased
 - 6. Flame Spread: Class A.
- 2.2 ADHESIVES, GROUT, SEALANTS, AND STONE ACCESSORIES
 - A. General: Use only adhesives formulated for composite stone and recommended by their manufacturer for the application indicated. Use adhesives that have a VOC content of not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - B. Water-Cleanable Epoxy Adhesive: ANSI A118.3.
 - 1. Available Manufacturers: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Laticrete International, Inc.
 - b. MAPEI Corp.
 - C. Sealant for Countertops: Manufacturer's standard sealant of characteristics indicated below that comply with applicable requirements in Division 07 Section "Joint Sealants" and will not stain the composite stone it is applied to.
 - 1. DAP, as recommended by countertop manufacturer.
 - 2. Color: As selected by Architect from manufacturer's full range.

D. Cleaner: Cleaner specifically formulated for composite stone types, finishes, and applications indicated, as recommended by composite stone producer and, if a sealer is specified, by sealer manufacturer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.

2.3 FABRICATION, GENERAL

- A. Fabricate composite stone countertops in sizes and shapes required to comply with requirements indicated, including details on Drawings and Shop Drawings.
 - 1. Dress joints straight and at right angle to face, unless otherwise indicated.
 - 2. Cut and drill sinkages and holes in composite stone for anchors, supports, and attachments.
 - 3. Provide openings, reveals, and similar features as needed to accommodate adjacent work.
 - 4. Fabricate molded edges with machines having abrasive shaping wheels made to reverse contour of edge profile to produce uniform shape throughout entire length of edge and with precisely formed arris slightly eased to prevent snipping, and matched at joints between units. Form corners of molded edges as indicated with outside corners slightly eased, unless otherwise indicated.
 - 5. Finish exposed faces of composite stone to comply with requirements indicated for finish of each type of composite stone required and to match approved Samples and mockups. Provide matching finish on exposed edges of countertops, splashes, and cutouts.
- B. Carefully inspect finished composite stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.

2.4 COUNTERTOPS

- A. Nominal Thickness: Provide thickness indicated.
- B. Edge Detail: As indicated.
- C. Joints: Fabricate countertops without joints, to greatest extent possible. Where not possible fabricate countertops in sections for joining in field, with joints at locations indicated and as follows:
 - 1. Sealant-Filled Joints: 1/16 inch (1.5 mm) in width.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates indicated to receive composite stone countertops and conditions under which composite stone countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

- 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of composite stone countertops.
- 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Advise installers of other work about specific requirements for placement of inserts and similar items to be used by composite stone countertop Installer for anchoring composite stone countertops. Furnish installers of other work with Drawings or templates showing locations of these items.
- 3.3 CONSTRUCTION TOLERANCES
 - A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 48 inches (1.5 mm in 1200 mm).
 - B. Variation from Level: Do not exceed 1/8 inch in 96 inches (3 mm in 2400 mm), 1/4 inch (6 mm) maximum.
 - C. Variation in Joint Width: Do not vary joint thickness more than 1/4 of nominal joint width.
 - D. Variation in Plane at Joints (Lipping): Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.
 - E. Variation in Line of Edge at Joints (Lipping): Do not exceed 1/64-inch (0.4-mm) difference between edges of adjacent units, where edge line continues across joint.
- 3.4 INSTALLATION OF COUNTERTOPS
 - A. General: Install countertops by adhering to supports with water-cleanable epoxy adhesive.
 - B. Do not cut composite stone in field, unless otherwise indicated. If composite stone countertops or splashes require additional fabrication not specified to be performed at Project site, return to fabrication shop for adjustment.
 - C. Set composite stone to comply with requirements indicated on Drawings and Shop Drawings. Shim and adjust composite stone to locations indicated, with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances. Install anchors and other attachments indicated or necessary to secure composite stone countertops in place.
 - D. Bond joints with composite stone adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
 - E. Apply sealant to joints and gaps specified for filling with sealant; comply with Division 07 Section "Joint Sealants." Remove temporary shims before applying sealant.

3.5 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive and sealant smears immediately.
- B. Remove and replace composite stone countertops of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged composite stone.
 - 2. Defective countertops.
 - 3. Defective joints, including misaligned joints.
 - 4. Interior composite stone countertops and joints not matching approved Samples and mockups.
 - 5. Interior composite stone countertops not complying with other requirements indicated.
- C. Replace in a manner that results in composite stone countertops matching approved Samples and mockups, complying with other requirements, and showing no evidence of replacement.
- D. Clean composite stone countertops not less than six days after completion of sealant installation, using clean water and soft rags. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage composite stone.

END OF SECTION 123661