

PROJECT MANUAL



COLLETON COUNTY SCHOOL DISTRICT COLLETON COUNTY – CCMS – MECHANICAL REPLACEMENT COLLETON COUNTY MIDDLE SCHOOL 1379 TUSKEGEE AIRMEN DRIVE WALTERBORO, SC 29488

CONSTRUCTION DOCUMENTS

APRIL 30, 2024

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LS3P COMMISSION NO.: 1201-240076

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**VOLUME No. 1 of 1
DIVISIONS 00 - 23**

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DOCUMENT 001113 - ADVERTISEMENT FOR BIDS

1.1 PROJECT INFORMATION

- A. Notice to Bidders: Qualified Bidders to submit bids for Project as described in this Document and in accordance with the Instructions to Bidders.
1. Regulatory Requirements: Applicable laws and regulations as indicated shall govern submittal, opening, and award of bids.
- B. Project Identification: Colleton County – CCMS - Mechanical Renovation
1. Project Location: Colleton County Middle School. 1379 Tuskegee Airmen Drive, Walterboro, SC 29488.
- C. Owner: Colleton County School District:
1. Main Office: 500 Forest Circle, Walterboro, SC 29488.
 2. Office of Buildings and Grounds: 246 Beach Road, Walterboro, SC 29488.
 - a. Owner's Representative: Mr. Eric Hamilton, Director of Buildings and Grounds; ehamilton@colleton.k12.sc.us.
- D. Architect Identification: The Contract Documents were prepared for Project by LS3P ASSOCIATES LTD., 205-1/2 King Street, Charleston, SC 29401; (843)577-4444.
- E. Project Description: Construction Documents shall be provided for mechanical renovation and replacement at Colleton County Middle School at 1379 Tuskegee Airmen Drive. The scope is limited to replacing the existing DOAS unit in the 7th and 8th grade wing with a new ERU. The new unit will be a packaged DX-type unit with heating and cooling designed to dehumidify the outside air. The existing exhaust system will be modified to route the exhaust air back to the energy recovery unit. Design services include architectural coordination for ceilings and roof penetrations, electrical coordination for the units, and structural coordination for the new unit as needed.
1. Project cost range is anticipated to be under: N/A.
- F. Construction Contract: Bids will be received for the following Work:
1. General contract (all trades).

1.2 BID SUBMITTAL AND OPENING

- A. Bid Submittal, Printed: Owner will receive sealed Lump Sum bids until the Bid time and date at the location indicated below. Owner will consider bids prepared in compliance with the Instructions to Bidders and delivered as follows:
1. Bid Date: **June 6, 2024.**
 2. Bid Time: **2:00 p.m., local time.**
 3. Location: **Colleton County School District Office, 500 Forest Circle Drive, Walterboro, SC 29488.**

4. Bids will be thereafter publicly opened and read aloud.
- B. Bid Submittal, Electronic: Owner will receive electronically submitted bids until the Bid time and date via web-based bidding management software. Owner will consider bids prepared in compliance with the Instructions to Bidders and delivered as follows:
1. Bid Date: **June 6, 2024**
 2. Bid Time: **Not later than 2:00 p.m., local time.**
 1. Web-Based Bidding Management Software: Procurement - Colleton County School District.
 3. Bids will be thereafter opened and read aloud via public webcast and teleconference as indicated in the Instructions to Bidders.

1.3 BID SECURITY

- A. Submit bid security with each Bid in the stipulated form and in the amount identified in the Instructions to Bidders.

1.4 PREBID MEETING

- A. Prebid Meeting: See Document 002513 "Prebid Meetings."
- B. Prebid Meeting, In Person: **A prebid meeting for all Bidders will be held at Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488 on May 21, 2024 at 10:00 a.m., local time. Prospective prime Bidders are requested to attend.**
- C. Prebid Meeting, Web Based: A prebid meeting for all Bidders will be held on N/A local time.
- D. Bidders' Questions: Architect will provide responses at prebid conference to Bidders' questions received up to two business days prior to conference. Submit requests for clarification and interpretation using method indicated in Instructions to Bidders.
- E. Site Walkthrough Meeting: **A site walkthrough meeting for all Bidders will be held at Project location on May 21, 2024 at 10:00 a.m. local time, following the Prebid Meeting. Prospective prime Bidders are requested to attend. Register for site walkthrough meeting as follows: In-Person Site Visit.**

1.5 BIDDING DOCUMENTS

- A. Bidding Documents, Printed: **Obtain after May 14, 2024 by contacting Colleton County School District, Department of Buildings & Grounds. Documents will be provided to prime Bidders only. Only complete sets of documents will be issued.**
1. Deposit: **N/A.**
 2. Shipping: Additional shipping charges of **N/A** will apply.
- B. Bidding Documents, Electronic: **Obtain after May 14, 2024 by contacting Colleton County School District, Department of Buildings & Grounds. Online access will be provided to prime Bidders only, all registered Bidders and sub-bidders, and suppliers.**

1.6 TIME OF COMPLETION

- A. By submitting a Bid, Bidder represents that Bidder will begin the Work on receipt of the Notice to Proceed and will complete the Work within the Contract Time indicated in the Bidding Documents.

1.7 LIQUIDATED DAMAGES

- A. Work is subject to liquidated damages.

1.8 BIDDER'S QUALIFICATIONS

- A. Prequalification: Bidders must have been prequalified by Owner prior to submission of bids.
- B. Qualifications: Owner's Bidder qualifications are available at **N/A**.
- C. Licenses: Bidders must be properly licensed under the laws governing their respective trades.
- D. Insurance and Bonds: A Performance Bond, separate Labor and Material Payment Bond, and insurance in a form acceptable to Owner will be required of the successful Bidder.
- E. Contractor's Qualification Statement: A completed AIA Document A305, "Contractor's Qualification Statement," with all exhibits is required to be submitted with the Bid.

1.9 NOTIFICATION

- A. This Advertisement for Bids document is issued by E.Hamilton, Director of Buildings & Grounds, ehamilton@colleton.k12.sc.us or L Grant, Administrative Specialist, lgrant@colleton.k12.sc.us.

END OF DOCUMENT 001113

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DOCUMENT 001116 - INVITATION TO BID

1.1 PROJECT INFORMATION

- A. Notice to Bidders: Selected Bidders are invited to submit Bids for Project as described in this Document in accordance with the Instructions to Bidders.
- B. Project Identification: Colleton County – CCMS – Mechanical Replacement; 1201-240076.
1. Project Location: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488.
- C. Owner: Colleton County School District:
1. Main Office: 500 Forest Circle, Walterboro, SC 29488.
 2. Office of Buildings and Grounds: 246 Beach Road, Walterboro, SC 29488.
 - a. Owner's Representative: Mr. Eric Hamilton, Director of Building and Grounds; erichamilton@colleton.k12.sc.us.
 3. Architect: LS3P ASSOCIATES LTD., 205-1/2 King Street, Charleston, SC 29401; (843) 577-4444.
 4. Architect's Representative: Mrs. Kameron K. Quick, AIA, kameronquick@ls3p.com.
- D. Project Description: Construction Documents shall be provided for mechanical renovation and replacement at Colleton County Middle School at 1379 Tuskegee Airmen Drive. The scope is limited to replacing the existing DOAS unit in the 7th and 8th grade wing with a new ERU. The new unit will be a packaged DX-type unit with heating and cooling designed to dehumidify the outside air. The existing exhaust system will be modified to route the exhaust air back to the energy recovery unit. Design services include architectural coordination for ceilings and roof penetrations, electrical coordination for the units, and structural coordination for the new unit as needed.
- E. Construction Contract: Bids will be received for the following Work: General Contract (all trades).

1.2 BID SUBMITTAL AND OPENING

- A. Bid Submittal, Printed: Owner will receive sealed Bids until the bid time and date at the location indicated below. Owner will consider Bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:
1. Bid Date: **June 6, 2024.**
 2. Bid Time: **2:00 p.m.,** local time.
 3. Location: **Colleton County School District Office, 500 Forest Circle, Walterboro, SC 29488.**
 4. Bids will be thereafter opened in the presence of the Bidders and read aloud.

- B. Bid Submittal, Electronic: Owner will receive electronically submitted Bids until the bid time and date via web-based bidding management software. Owner will consider Bids prepared in compliance with the Instructions to Bidders and delivered as follows:

1. Bid Date: **June 6, 2024.**
2. Bid Time: **Not later than 2:00 p.m., local time.**
3. Web-Based Bidding Management Software:
<http://www.colleton.k12.sc.us/departments/procurement>.
- 4.
5. Bids will be thereafter opened: N/A

1.3 BID SECURITY

- A. Submit bid security with each Bid in the stipulated form and in the amount identified in the Instructions to Bidders.

1.4 WAGE REQUIREMENTS

- A. Refer to Section 011000 "Summary" for Davis-Bacon Act for wage requirements.

1.5 PREBID MEETINGS

- A. Prebid Meeting: See Document 002513 "Prebid Meetings."
- B. Prebid Meeting, **In Person: A prebid meeting for all Bidders will be held at Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488 on May 21, 2024 at 10:00 a.m., local time.** Prospective prime Bidders are requested to attend.
- C. Prebid Meeting, Web Based: A prebid meeting: N/A.
- D. Bidders' Questions: Architect will provide responses at Prebid conference to Bidders' questions received up to two business days prior to conference. Submit requests for clarification and interpretation using method indicated in Instructions to Bidders.
- E. Site Walkthrough Meeting: **A site walkthrough meeting for all Bidders will be held at Project location on May 21, 2024 at 10:00 a.m., local time, immediately following the Prebid Meeting.** Prospective prime Bidders are requested to attend. Register for Site Walkthrough Meeting as follows: N/A.

1.6 BIDDING DOCUMENTS

- A. Bidding Documents, Printed: **Obtain after May 14, 2024 by contacting Colleton County School District, Department of Buildings & Grounds Only complete sets of documents will be issued.**
1. Deposit: N/A.
 2. Shipping: Additional shipping charges of N/A will apply.

- B. Bidding Documents, Electronic: **Obtain after May 14, 2024 by contacting Colleton County School District, Department of Buildings & Grounds. Online access will be provided to all registered Bidders and Sub-Bidders and suppliers.**

1.7 TIME OF COMPLETION

- A. By submitting a Bid, Bidder represents that Bidder will begin the Work on receipt of the Notice to Proceed and will complete the Work within the Contract Time indicated in the Bidding Documents.

1.8 LIQUIDATED DAMAGES

- A. Work is subject to liquidated damages.

1.9 BIDDER'S QUALIFICATIONS

- A. Prequalification: Invited Bidders must have been prequalified by Owner prior to submission of Bids.
- B. Licenses: Bidders must be properly licensed under the laws governing their respective trades.
- C. Insurance and Bonds: A Performance Bond, separate Labor and Material Payment Bond, and insurance in a form acceptable to Owner will be required of the successful Bidder.
- D. Contractor's Qualification Statement: A completed AIA Document A305, "Contractor's Qualification Statement," with all exhibits is required to be submitted with the bid: **N/A.**

END OF DOCUMENT 001116

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DOCUMENT 002113 - INSTRUCTIONS TO BIDDERS

1.1 INSTRUCTIONS TO BIDDERS

- A. AIA Document A701-2018, "Instructions to Bidders," is hereby incorporated into the Bidding Documents by reference.
 - 1. A copy of AIA Document A701-2018, "Instructions to Bidders," is bound in this Project Manual.
 - 2. Document 002213 "Supplementary Instructions to Bidders" is bound in this Project Manual.

END OF DOCUMENT 002113

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DRAFT AIA® Document A701™ – 2018

Instructions to Bidders

for the following Project:

(Name, location, and detailed description)

«Colleton County – CCMS – Mechanical Replacement; 1201-240076 »
«Colleton County Middle School
1379 Tuskegee Airmen Drive »
«Walterboro, SC 29488 »

THE OWNER:

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

«Colleton County School District »« »
«500 Forest Circle »
«Walterboro, SC 29488 »
« »

THE ARCHITECT:

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

«LS3P ASSOCIATES LTD »« »
«205-1/2 King Street »
«Charleston, SC 29401 »
« »

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- 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

ADDITIONS AND DELETIONS:

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

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

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™-2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

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

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

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

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

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

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

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§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids. *(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)*

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§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

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

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

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§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning « > » days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

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

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:
(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

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§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

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

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

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

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

« »

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

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

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.

(Insert the complete AIA Document number, including year, and Document title.)

« »

- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.

(Insert the complete AIA Document number, including year, and Document title.)

« »

- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

« »

- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013.)

« »

- .5 Drawings

Number	Title	Date
See LS3P Colleton County – CCMS Mechanical Replacement; 1201-240076		

- .6 Specifications

Section	Title	Date	Pages
See LS3P Colleton County – CCMS Mechanical Replacement; 1201-240076			

- .7 Addenda:

Number	Date	Pages

- .8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

« »

The Sustainability Plan:

Title	Date	Pages

Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.9 Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

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DOCUMENT 002213 - SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

1.1 INSTRUCTIONS TO BIDDERS

A. Instructions to Bidders for Project consist of the following:

1. AIA Document A701-2018, "Instructions to Bidders ," a copy of which is bound in this Project Manual.
2. The following Supplementary Instructions to Bidders that modify and add to the requirements of the Instructions to Bidders.

1.2 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS, GENERAL

- A. The following supplements modify AIA Document A701-2018, "Instructions to Bidders." Where a portion of the Instructions to Bidders is modified or deleted by these Supplementary Instructions to Bidders, unaltered portions of the Instructions to Bidders will remain in effect.

1.3 ARTICLE 2 - BIDDER'S REPRESENTATIONS

A. Add the following to 2.1:

1. .7 The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted bid the cost of such fees, permits, and requirements not otherwise indicated as provided by Owner.
2. .8 The Bidder is a properly licensed Contractor according to the laws and regulations of Colleton County, South Carolina and meets qualifications indicated in the Bidding Documents.
3. .9 The Bidder has incorporated into the Bid adequate sums for work performed by Installers whose qualifications meet those indicated in the Bidding Documents.

1.4 ARTICLE 3 - BIDDING DOCUMENTS

A. 3.1 - Distribution:

1. Add the following to 3.1.1:
 - a. Obtain Bidding Documents as instructed in the Invitation to Bid.

B. 3.2 - Modification or Interpretation of Bidding Documents:

1. Add the following to 3.2.2:
 - a. Submit Bidder's Requests for Interpretation using form bound in the Project Manual.

C. 3.4 - Addenda:

1. Add the following to 3.4.1:

- a. Addenda will be transmitted by the issuing office using web-based bidding management software indicated in the Advertisement for Bids or via email.
2. Delete 3.4.3 and replace with the following:
 - a. 3.4.3 Addenda may be issued at any time prior to the receipt of bids.

1.5 ARTICLE 4 - BIDDING PROCEDURES

A. 4.1 - Preparation of Bids:

1. Add the following to 4.1.1:
 - a. Printable electronic Bid Forms and related documents are as indicated.
2. Add the following to 4.1.8:
 - a. The Bid shall include unit prices when called for by the Bidding Documents. Owner may elect to consider unit prices in the determination of award. Owner may elect to incorporate unit prices in the Contract.
3. Add the following to 4.1:
 - a. 4.1.9 Owner may elect to disqualify a bid due to failure to submit a bid in the form requested, failure to bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any alternates, conditions, limitations or provisions not called for.
 - b. 4.1.10 Bids shall include sales and use taxes. Contractors shall show separately with each monthly payment application the sales and use taxes paid by them and their subcontractors in the form indicated. Reimbursement of sales and use taxes, if any, shall be applied for by Owner for the sole benefit of Owner.

B. 4.2 - Bid Security:

1. Add the following to 4.2.1:
 - a. Provide bid security in the amount of 5 percent of the bid amount in the form of a cashier's check or surety bond meeting the requirements of 4.2.3.

C. 4.3 - Submission of Bids:

1. Add the following to 4.3.1:
 - a. Submit printed bids at the time and place indicated in the Advertisement for Bids.
 - b. Submit electronic bids using web-based bidding management software indicated in the Advertisement for Bids.

D. 4.4 - Modification or Withdrawal of Bids:

1. Add the following to 4.4.1:

- a. .1 Such modifications to or withdrawal of a bid may only be made by persons authorized to act on behalf of the Bidder. Authorized persons are those so identified in the Bidder's corporate bylaws, specifically empowered by the Bidder's charter or similar legally binding document acceptable to Owner, or by a power of attorney, signed and dated, describing the scope and limitations of the power of attorney. Make such documentation available to Owner at the time of seeking modifications or withdrawal of the Bid.

E. 4.5 - Break-Out Pricing Bid Supplement:

1. Add 4.5.
2. Add the following to 4.5:
 - a. 4.5.1 Provide detailed cost breakdowns on forms provided no later than two business days following Architect's request.

F. 4.6 - Subcontractors, Suppliers, and Manufacturers List Bid Supplement:

1. Add 4.6.
2. Add the following to 4.6:
 - a. 4.6.1 Provide list of major subcontractors, suppliers, and manufacturers furnishing or installing products on forms provided no later than two business days following Architect's request. Include those subcontractors, suppliers, and manufacturers providing Work totaling three percent or more of the Bid amount. Do not change subcontractors, suppliers, and manufacturers from those submitted without approval of Architect.

1.6 ARTICLE 5 - CONSIDERATION OF BIDS

A. 5.2 - Rejection of Bids:

1. Add the following to 5.2:
 - a. 5.2.1 Owner reserves the right to reject a bid based on Owner's and Architect's evaluation of qualification information submitted following opening of bids. Owner's evaluation of the Bidder's qualifications will include: status of licensure and record of compliance with licensing requirements, record of quality of completed Work, record of Project completion and ability to complete, record of financial management including financial resources available to complete Project and record of timely payment of obligations, record of Project site management including compliance with requirements of authorities having jurisdiction, record of and number of current claims and disputes and the status of their resolution, and qualifications of the Bidder's proposed Project staff and proposed subcontractors.

1.7 ARTICLE 6 - POSTBID INFORMATION

A. 6.1 - Contractor's Qualification Statement:

1. Add the following to 6.1:

- a. 6.1.1 Submit Contractor's Qualification Statement no later than two business days following Architect's request.

B. 6.3 - Submittals:

1. Add the following to 6.3.1:

- a. .4 Submit information requested in 6.3.1. no later than two business days following Architect's request.

1.8 ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

A. 7.1 - Bond Requirements:

1. Add the following to 7.1.1:

- a. .1 Both a Performance Bond and a Payment Bond will be required, each in an amount equal to 100 percent of the Contract Sum.

B. 7.2 - Time of Delivery and Form of Bonds:

1. Replace the first sentence of 7.2.1 with the following:

- a. The Bidder shall deliver the required bonds to Owner no later than 10 days after the date of a Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default.

2. Replace 7.2.3 with the following:

- a. 7.2.3 Bonds shall be executed and be in force on the date of the execution of the Contract.

1.9 ARTICLE 8 - ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

A. 8.1 - Proposed Contract Documents:

1. Replace .5 in 8.1 with the following:

- a. .5 Enumeration of Drawings: The Drawings constituting a portion of the proposed Contract Documents are identified on the Cover Sheet or Title Sheet of the Drawings titled **Colleton County – CCMS – Mechanical Replacement** dated **April 30, 2024**

2. Replace .6 in 8.1 with the following:

- a. .6 Enumeration of Specifications: The Specifications constituting a portion of the proposed Contract Documents are identified on the Table of Contents Sheet of the Project Manual titled **Colleton County – CCMS – Mechanical Replacement** dated **April 30, 2024**

- b. Replace .7 in 8.1 with the following:
 - c. .7 Addenda: Portions of the Addenda constituting a portion of the proposed Contract Documents will be enumerated in the Owner/Contractor Agreement.
3. Replace .8 in 8.1 with the following:
- a. .8 Other Exhibits: Other Exhibits constituting portions of the proposed Contract Documents will be identified in the Bidding Documents and be enumerated in the Owner/Contractor Agreement.

1.10 ARTICLE 9 - EXECUTION OF THE CONTRACT

- A. Add Article 9.
- B. Add the following to Article 9:
 - 1. 9.1 Subsequent to the Notice of Intent to Award, and within 10 days after the prescribed Form of Agreement is presented to the Awardee for signature, the Awardee shall execute and deliver the Agreement to Owner through Architect, in such number of counterparts as Owner may require.
 - 2. 9.2 Owner may deem as a default the failure of the Awardee to execute the Contract and to supply the required bonds when the Agreement is presented for signature within the period of time allowed.
 - 3. 9.3 Unless otherwise indicated in the Bidding Documents or the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement or the date that the Bidder is obligated to deliver the executed Agreement and required bonds to Owner.
 - 4. 9.4 In the event of a default, Owner may declare the amount of the Bid security forfeited and elect to either award the Contract to the next responsible bidder or re-advertise for bids.

END OF DOCUMENT 002213

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DOCUMENT 002513 - PREBID MEETINGS

1.1 PREBID MEETING

A. Architect will conduct a prebid meeting as indicated below:

1. Meeting Date: **May 21, 2024.**
2. Meeting Time: **10:00 a.m., local time.**
3. Location, **In-Person Meeting: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488.**
4. Information provided during Prebid Meeting does not constitute a modification to the Procurement and Contracting Documents. Modifications to the Procurement and Contracting Documents are issued by written Addendum only.

B. Attendance:

1. Prime Bidders: Attendance at Prebid Meeting is recommended.
2. Subcontractors: Attendance at Prebid Meeting is recommended.
3. Notice: Bids will only be accepted from prime bidders represented on Prebid Meeting sign-in sheet.

C. Bidder Questions: Submit written questions to be addressed at Prebid Meeting minimum of two business days prior to meeting.

1. Submit requests for clarification or interpretation using form bound in Project Manual.
2. Submit requests for substitution/prior approval using form bound in Project Manual.

D. Agenda: Prebid Meeting agenda will include review of topics that may affect proper preparation and submittal of bids, including the following:

1. Procurement and Contracting Requirements:

- a. Advertisement for Bids.
- b. Instructions to Bidders.
- c. Bidder qualifications.
- d. Bonding.
- e. Insurance.
- f. Bid security.
- g. Bid Form and attachments.
- h. Bid submittal requirements.
- i. Bid Submittal Checklist.
- j. Notice of Award.

2. Communication during Bidding Period:

- a. Obtaining documents.
- b. Access to Project web-based bidding management software site.
- c. Bidder's Requests for Information.
- d. Bidder's Substitution Request/Prior Approval Request.
- e. Addenda.

3. Contracting Requirements:
 - a. Agreement.
 - b. The General Conditions.
 - c. The Supplementary Conditions.
 - d. Other Owner requirements.
 4. Construction Documents:
 - a. Scope of Work.
 - b. Temporary facilities.
 - c. Use of site.
 - d. Work restrictions.
 - e. Alternates, allowances, and unit prices.
 - f. Substitutions following award.
 5. Separate Contracts:
 - a. Work by Owner.
 - b. Work of other Contracts.
 6. Schedule:
 - a. Project schedule.
 - b. Contract Time.
 - c. Liquidated damages.
 - d. Other Bidder questions.
 7. Site/facility visit or walkthrough.
 8. Post-meeting addendum.
- E. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes to attendees and others known by issuing office to have received a complete set of Procurement and Contracting Documents. Minutes of meeting are issued as Available Information and do not constitute a modification to the Procurement and Contracting Documents. Modifications to the Procurement and Contracting Documents are issued by written Addendum only.
1. Sign-in Sheet: Minutes will include list of meeting attendees.
 2. List of Planholders: Minutes will include list of planholders.

1.2 SITE WALKTHROUGH

- A. Site walkthrough will be conducted by members of Project team **following the Prebid Meeting, May 21, 2024, at 10:00 a.m., indicated in Advertisement for Bid.**

END OF DOCUMENT 002513

DOCUMENT 002600 - PROCUREMENT SUBSTITUTION PROCEDURES**1.1 DEFINITIONS**

- A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids in accordance with Instructions to Bidders.
- B. Procurement Prior Approval Requests: Requests for approval of products or manufacturers from those required by the Contract Documents as defined by product selection procedures in Section 016000 "Product Requirements."
 - 1. Procurement prior approval is required when products or manufacturers are listed in specifications under "Sole Product," "Sole Manufacturer," "Limited List of Products," or "Limited List of Manufacturers" introductory paragraphs.
 - 2. Procurement prior approval is not required when products or manufacturers are listed in specifications under "Non-Limited List of Products" or "Non-Limited List of Manufacturers" introductory paragraphs.
 - 3. Where use of "Sole Product," "Sole Manufacturer," "Limited List of Products," or "Limited List of Manufacturers" introductory paragraphs is not allowed by statute, procurement prior approval request is not required.
- C. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See the General Conditions and Section 012500 "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

1.2 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.3 PROCUREMENT SUBSTITUTIONS

- A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.
- B. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
 - 1. Extensive revisions to the Contract Documents are not required.
 - 2. Proposed changes are in keeping with general intent of the Contract Documents, including level of quality of the Work represented by requirements therein.
 - 3. Request is fully documented and properly submitted.

1.4 SUBMITTALS

A. Procurement Substitution Request: Submit to Architect. Procurement Substitution Request must be made in writing by prime contract Bidder only in compliance with the following requirements:

1. Requests for substitution of materials and equipment will be considered if received no later than 10 days prior to date of bid opening.
2. Submittal Format, Printed: Submit three copies of each written Procurement Substitution Request, using form bound in Project Manual. Refer to Document 002600-A "Procurement Substitution Request Form" appended to this document.
3. Submittal Format, Electronic: Submit Procurement Substitution Request, using format provided on Project web-based bidding management software site.
 - a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and Drawing numbers.
 - b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
 - 1) List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - 2) Product data, including drawings and descriptions of products and fabrication and installation procedures.
 - 3) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
 - 4) Copies of current, independent third-party test data of salient product or system characteristics.
 - 5) Samples where applicable or when requested by Architect.
 - 6) Detailed comparison of significant qualities of proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - 7) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - 8) Research reports, where applicable, evidencing compliance with building code in effect for Project, from ICC-ES.
 - 9) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate proposed substitute.
 - c. Provide certification by manufacturer that proposed substitute is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to product or equipment specified in the application indicated.
 - d. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of substitute to perform as represented in the Procurement Substitution Request.

B. Architect's Action:

1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all Bidders of acceptance of proposed substitute by means of an Addendum to the Procurement and Contracting Documents.
- C. Architect's approval of substitute during bidding does not relieve Contractor of the responsibility to submit required Shop Drawings and to comply with all other requirements of the Contract Documents.

END OF DOCUMENT 002600

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DOCUMENT 002600A - PROCUREMENT SUBSTITUTION REQUEST FORM

COMPLETE AND SUBMIT THIS FORM FOR APPROVAL OF SUBSTITUTES. ELECTRONIC SUBMISSION SHALL BE MADE FOR EACH PROPOSED SUBSTITUTE ITEM IN ACCORDANCE WITH SECTION 014240 - MUHA DOCUMENTATION STANDARDS.

PROJECT ARCH. NAME & E-MAIL: Mrs. Kameron K. Quick, AIA; kameronquick@ls3p.com

PROJECT NAME: Colleton County – CCMS - Mechanical Replacement

SPECIFIED ITEM PROPOSED TO BE REPLACED:

Section	Paragraph	Specified Item
_____	_____	_____

PROPOSED SUBSTITUTION: _____

- 1) Attach complete technical data, including laboratory tests, if applicable.
- 2) Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.
- 3) Provide the following information detailing the effect the substitution will have on the project.:

A. Does the substitution affect dimensions shown on the drawings?

Yes ____ No ____

B. Will the undersigned pay for changes to building design, including engineering and detailing costs caused by the requested substitution?

Yes ____ No ____

C. What effect does proposed substitution have on other trades?

D. What differences are there between specified item and proposed substitution?

E. Manufacturer's guarantees of proposed and specified items are:

Same ____ Different ____ (explain below and on attachments)

The Undersigned states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Print Name

Signature

Title

Date

Firm

Address

City/State/Zip

Telephone

Fax

For Use by Design Consultant

Accepted

Accepted as Noted

Not Accepted

Received Too Late

Signature

Printed Name

Date

NOTES:

DOCUMENT 003119 - EXISTING CONDITION INFORMATION

1.1 EXISTING CONDITION INFORMATION

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information. This Document and its attachments are not part of the Contract Documents.
- B. Existing Drawings that include information on existing conditions, including previous construction at Project site are available for viewing upon request from Architect or Owner.
- C. Existing specifications and submittals that include information on existing conditions, including previous construction at Project site are available for viewing upon request from Architect or Owner.
- D. Related Requirements:
 - 1. Document 002113 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.
 - 2. Document 003126 "Existing Hazardous Material Information" for hazardous materials reports that are made available to Bidders.
 - 3. Document 002513 "Prebid Meetings" for site walkthrough.

END OF DOCUMENT 003119

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DOCUMENT 003126 - EXISTING HAZARDOUS MATERIAL INFORMATION

1.1 EXISTING HAZARDOUS MATERIAL INFORMATION

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

- B. Hazardous material in the form of asbestos and lead -based paint is not anticipated on project.

END OF DOCUMENT 003126

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DOCUMENT 004100 - BID COVER SHEET

1.1 BID INFORMATION

- A. Project Name: Colleton County – CCMS – Mechanical Replacement
- B. Bidder: _____
- C. Bidder Address: _____
- D. Bid Submitter's Phone Number: _____
- E. Bidder Contractor's License Number: _____
- F. Bid Date: _____
- G. Bid Time: _____, local time.

END OF DOCUMENT 004100

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DOCUMENT 004113 - BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

1.1 BID INFORMATION

- A. Bidder: _____.
- B. Project Name: Colleton County – CCMS- Mechanical Replacement
- C. Project Location: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488
- D. Owner: Colleton County School District, 500 Forest Circle, Walterboro, SC 29488
- E. Architect: LS3P ASSOCIATES LTD.
- F. Architect Project Number: 1201-240076

1.2 CERTIFICATIONS AND BASE BID

- A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by LS3P ASSOCIATES LTD. and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including, necessary to complete the construction of the above-named Project, in accordance with the requirements of the Procurement and Contracting Documents, for the stipulated sum of:
 - 1. _____ Dollars (\$_____).
 - 2. The above amount may be modified by amounts indicated by the Bidder under the "Alternates" Article below.

1.3 BID SECURITY

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 60 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached Bid Security, as liquidated damages for such failure as follows:
 - 1. In the following amount constituting 5 percent of the Base Bid amount above:
 - a. _____ Dollars (\$_____).
 - 2. In the following amount constituting <Insert percentage> of the Base Bid amount above:
 - a. _____ Dollars (\$_____).
 - 3. In the following amount, as stipulated in Document 002113 "Instructions to Bidders":

a. _____ Dollars (\$_____).

B. Form of Bid Security: Bidder has attached the following:

- 1. AIA Document A310-2010, "Bid Bond."
- 2. Cashier's check.
- 3. Certified check.

C. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cashier's check, certified check, or bid bond.

1.4 SUBCONTRACTORS AND SUPPLIERS

A. The following companies to execute subcontracts for the portions of the Work indicated:

- 1. Concrete Work: _____.
- 2. Masonry Work: _____.
- 3. Roofing Work: _____.
- 4. Plumbing Work: _____.
- 5. HVAC Work: _____.
- 6. Electrical Work: _____.

1.5 TIME OF COMPLETION

A. Time of Completion:

- 1. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and to substantially complete the Work within _____ calendar days.
- 2. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and to substantially complete the Work within _____ calendar days.

1.6 ACKNOWLEDGMENT OF ADDENDA

A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

- 1. Addendum No. 1, dated _____.
- 2. Addendum No. 2, dated _____.
- 3. Addendum No. 3, dated _____.

4. Addendum No. 4, dated _____.

1.7 BID SUPPLEMENTS

A. The following supplements are a part of this Bid Form and are attached hereto:

1. AIA A310 – Bid Bond.

1.8 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, indicated jurisdiction, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.9 SUBMISSION OF BID

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

B. Submitted by: _____ (Name of bidding firm or corporation).

C. Authorized Signature: _____ (Handwritten signature).

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

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

F. Witnessed by: _____ (Handwritten signature).

G. Attest: _____ (Handwritten signature).

H. By: _____ (Type or print name).

I. Attester Title: _____ (Corporate Secretary or Assistant Secretary).

J. Street Address: _____.

K. City, State, Zip: _____.

L. Phone: _____.

M. License No.: _____.

N. Federal ID No.: _____.

(Affix Corporate Seal Here)

END OF DOCUMENT 004113

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DRAFT AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

« »
« »

SURETY:

(Name, legal status and principal place of business)

« »
« »

OWNER:

(Name, legal status and address)

«Colleton County School District »
«500 Forest Circle »
Walterboro, SC 29488

BOND AMOUNT: \$ « »

PROJECT:

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

«Colleton County – CCMS – Mechanical Replacement
Colleton County Middle School
1379 Tuskegee Airmen Drive
Walterboro, SC 29488
«LS3P Project No.: 1201-240076 »

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

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

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

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

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statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of ,

(Witness)

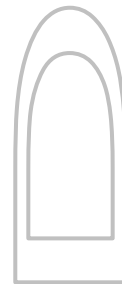
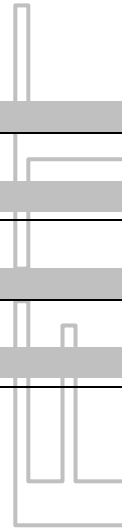
(Witness)

(Contractor as Principal) (Seal)

(Title)

(Surety) (Seal)

(Title)



DOCUMENT 004373 - PROPOSED SCHEDULE OF VALUES FORM

1.1 BID FORM SUPPLEMENT

- A. A completed Proposed Schedule of Values form is required to be attached to the Bid Form.

1.2 PROPOSED SCHEDULE OF VALUES FORM

- A. Proposed Schedule of Values Form: Provide a breakdown of the bid amount, including Alternates, in enough detail to facilitate continued evaluation of bid. Organize and label contents by section in accordance with the Project Manual table of contents.
 - 1. Provide multiple line items for principal material and subcontract amounts in excess of five percent of the Contract Sum.

END OF DOCUMENT 004373

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DOCUMENT 004393 - BID SUBMITTAL CHECKLIST

1.1 BID INFORMATION

- A. Project Name: Colleton County – CCMS – Mechanical Replacement
- B. Bidder: _____.
- C. Prime Contract, if applicable: _____.

1.2 BIDDER'S CHECKLIST

- A. To assist the Bidder in properly completing all documentation required, the following checklist is provided for the Bidder's convenience. The Bidder is solely responsible for verifying compliance with bid submittal requirements.
- B. Attach this completed checklist to the Bid Form.
 - 1. Used the Bid Form provided in the Project Manual.
 - 2. Prepared the Bid Form as required by the Instructions to Bidders.
 - 3. Indicated on the Bid Form the Addenda received.
 - 4. Indicated on the Bid Form cost associated with listed Unit Prices.
 - 5. Indicated on the Bid Form cost associated with listed Alternates.
 - 6. Attached to the Bid Form Bid Security in form and for the amount required.
 - 7. Attached to the Bid Form Proposed Schedule of Values Form.
 - 8. Attached to the Bid Form (AIA A310 – Bid Bond).
 - 9. Verified that the Bidder can provide executed Performance Bond and Labor and Material Bond as described in the Bidding Documents.
 - 10. Verified that the Bidder can provide Certificates of Insurance in the amounts indicated in the Bidding Documents.
 - 11. Used Bid Cover Sheet provided for electronic bids.
 - 12. Bid envelope for paper copy bids shows name and address of the Bidder.
 - 13. Bid envelope for paper copy bids shows the Bidder's Contractor's License Number.
 - 14. Bid envelope for paper copy bids shows name of Project being bid.
 - 15. Bid envelope for paper copy bids shows name of Prime Contract being bid, if applicable.

16. Bid envelope for paper copy bids shows time and day of Bid Opening.

END OF DOCUMENT 004393

DOCUMENT 005100 - NOTICE OF AWARD

1.1 BID INFORMATION

- A. Bidder: _____
- B. Bidder’s Address: _____
- C. Prime Contract: _____
- D. Project Name: Colleton County – CCMS – Mechanical Replacement
- E. Project Location: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488
- F. Owner: Colleton County School District
- G. Architect: LS3P ASSOCIATES LTD.
- H. Architect Project Number: 1201-240076

1.2 NOTICE OF INTENT TO AWARD CONTRACT

- A. Notice: The above Bidder is hereby notified that their Bid, dated June 6, 2024, for the above Contract has been considered and the Bidder will be awarded a Contract for mechanical replacement scope at Colleton County Middle School.
- B. Alternates Accepted: Accepted alternates are indicated in the Owner/Contractor Agreement.
- C. Contract Sum: The Contract Sum including accepted alternates, if applicable, is:
 - 1. _____dollars (\$ _____).
 - 2. Indicated in the Owner/Contractor Agreement.

1.3 NOTICE OF AWARD OF CONTRACT

- A. Notice: The above Bidder is hereby notified that their Bid, dated June 6, 2024, for the above Contract has been considered and the Bidder will be awarded a Contract for mechanical replacement scope at Colleton County Middle School.
- B. Alternates Accepted: Accepted alternates are indicated in the Owner/Contractor Agreement.
- C. Contract Sum: The Contract Sum including accepted alternates, if applicable, is:
 - 1. _____dollars (\$ _____).
 - 2. Indicated in the Owner/Contractor Agreement.

1.4 EXECUTION OF CONTRACT

- A. Contract Documents: Executable copies of the Contract Documents will be made available to the Bidder immediately. The Bidder must comply with the following conditions precedent within 10 days of the above date of issuance of the Notice:
1. Deliver to Owner three sets of fully executed copies of the Owner/Contractor Agreement and associated documents indicating a requirement for signature by the Contractor.
 2. Deliver with the executed Owner/Contractor Agreement the Bonds and Certificates of Insurance required by the Contract Documents.
- B. Compliance: Failure to comply with conditions of this Notice within the time specified will entitle Owner to consider the Bidder in default, annul this Notice, and declare the Bidder's Bid security forfeited.
1. Within 10 days after the Bidder complies with the conditions of this Notice, Owner will return to the Bidder one fully executed copy of the Owner/Contractor Agreement.

1.5 NOTIFICATION

- A. This Notice is issued by:
1. Owner: Colleton County School District, 500 Forest Circle, Walterboro, SC 29488
 2. Authorized Signature: _____.
 3. Signed By: Mr. Eric Hamilton
 4. Title: Director of Building and Grounds.

END OF DOCUMENT 005100

DOCUMENT 006000 - PROJECT FORMS

1.1 FORM OF AGREEMENT AND GENERAL CONDITIONS

- A. The following form of Owner/Contractor Agreement and form of the General Conditions to be used for Project:
1. AIA Document A101-2017 "Standard Form of Agreement between Owner and Contractor Where the Basis of Payment is a Stipulated Sum."
 - a. The General Conditions for Project are AIA Document A201-2017 "General Conditions of the Contract for Construction."
 2. The General Conditions are included in the Project Manual.

1.2 ADMINISTRATIVE FORMS

- A. Administrative Forms: Additional administrative forms are specified in Division 01 General Requirements.
- B. Copies of AIA standard forms may be obtained from AIA Contract Documents: <https://aicontracts.com>.
- C. Preconstruction Forms:
1. Form of Performance Bond and Labor and Material Bond: AIA Document A312-2010 "Performance Bond" and AIA Document A312-2010 "Payment Bond."
 2. Form of Certificate of Insurance: AIA Document G715-2017 "Supplemental Attachment for ACORD Certificate of Insurance 25."
- D. Information and Modification Forms:
1. Form for Requests for Information (RFIs): AIA Document G716-2004 "Request for Information (RFI)."
 2. Form of Request for Proposal: AIA Document G709-2018 "Proposal Request."
 3. Change Order Form: AIA Document G701-2017 "Change Order."
 4. Form of Architect's Memorandum for Minor Changes in the Work: AIA Document G710-2017 "Architect's Supplemental Instructions."
 5. Form of Change Directive: AIA Document G714-2017 "Construction Change Directive."
- E. Payment Forms:
1. Schedule of Values Form: AIA Document G703-1992 "Continuation Sheet."
 2. Payment Application, Lump Sum Project: AIA Document G702-1992 "Application and Certificate for Payment" and G703-1992 "Continuation Sheet."
 3. Form of Contractor's Affidavit: AIA Document G706-1994 "Contractor's Affidavit of Payment of Debts and Claims".
 4. Form of Affidavit of Release of Liens on Progress Payments: AIA Document G901-2022 "Conditional Waiver and Release on Progress Payment".

5. Form of Affidavit of Release of Liens on Final Payments: AIA Document G903-2022 "Conditional Waiver and Release on Final Payment".
6. Form of Consent of Surety: AIA Document G707-1994 "Consent of Surety to Final Payment."

END OF DOCUMENT 006000

DOCUMENT 006313 - CONTRACTOR'S RFI FORM

Project:	Colleton County – CCMS - Mechanical Replacement	1201-240076	RFI # :
To:	LS3P ASSOCIATES LTD. 205-1/2 King Street Charleston, SC 29401	Date:	
Attn.:	Mrs. Kameron Quick, AIA	Contractor:	
Phone	843-577-4444	By:	
Fax:	843-722-4789	Voice:	
Email:	kameronquick@ls3p.com	Fax:	
		Email:	

Related Section & Paragraph # _____

Related Drawings/Details: _____

Contractor's _____

Contractor's Recommended _____

Attachments: _____

Architect's response requested by: _____

Architect's Response: _____

Signed: _____ Date: _____

Attachment _____

Distribution _____

END OF DOCUMENT 006313

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DRAFT AIA® Document A101™ – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

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)

«Colleton County School District »« »
«500 Forest Circle »
«Walterboro, SC 29488 »
« »

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

« »« »
« »
« »
« »

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

«Colleton County – CCMS - Mechanical Replacement »
«Colleton County Middle School
1379 Tuskegee Airmen Drive »
«Walterboro, SC 29488 »

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

«LS3P ASSOCIATES LTD. »« »
«205-1/2 King Street »
«Charleston, SC 29401 »
« »

The Owner and Contractor agree as follows.

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

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

The parties should complete A101™-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND 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

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 a Modification, appears in Article 9.

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.

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

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

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

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(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: « »

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

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

§ 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 « » (\$ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 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.)

Item	Price	Conditions for Acceptance

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

Item	Price

§ 4.4 Unit prices, if any:

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

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

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

« »

§ 4.6 Other:

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

<< >>

§ 5.1 Progress Payments

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

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

<< >>

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the << >> day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the << >> day of the << >> month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than << >> (<< >>) days after the Architect receives the Application for Payment.

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

§ 5.1.4 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 Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 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.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 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.

§ 5.1.6.2 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 A201–2017;
- .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 A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

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

<< >>

§ 5.1.7.1.1 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 Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

<< >>

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, 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 at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

<< >>

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

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

§ 5.2 Final Payment

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

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

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

<< >>

§ 5.3 Interest

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.)

<< >> % << >>

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the 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 A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

Arbitration pursuant to Section 15.4 of AIA Document A201–2017

Litigation in a court of competent jurisdiction

Other *(Specify)*

<< >>

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

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, 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.)

<< >>

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 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)

<< >>
<< >>
<< >>
<< >>
<< >>

<< >>

§ 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 A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, 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 A101™-2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

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

<< >>

§ 8.7 Other provisions:

<< >>

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™-2017, General Conditions of the Contract for Construction
- .4 AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

(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 E204™-2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[] The Sustainability Plan:

Title	Date	Pages

[] Supplementary and other Conditions of the Contract:

Document	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 A201™-2017 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 entered into as of the day and year first written above.

OWNER *(Signature)*

 << >> >>

(Printed name and title)

CONTRACTOR *(Signature)*

 << >> >>

(Printed name and title)

DRAFT AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

«Colleton County – CCMS – Mechanical Replacement »
«Colleton County Middle School
1379 Tuskegee Airmen Drive
Walterboro, SC 29488 »

THE OWNER:

(Name, legal status and address)

«Colleton County School District »« »
« 500 Forest Circle
Walterboro, SC 29488 »

THE ARCHITECT:

(Name, legal status and address)

«LS3P ASSOCIATES LTD.
205-1/2 King Street »« »
«Charleston, SC 29401 »

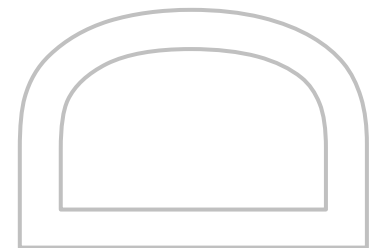
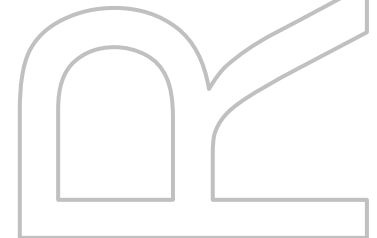
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ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well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

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.



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14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES



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§ 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

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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 a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's 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 the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

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

§ 1.2 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 E203™–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 E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party’s sole risk

and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

§ 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 Architect does 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

§ 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.

§ 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 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 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.

§ 2.3.5 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.

§ 2.3.6 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.

§ 2.4 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 prior approval of the Architect and the 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 Architect's 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.

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

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

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's 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 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 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 Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the 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 and 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. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons 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 Work 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 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 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 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

The Contractor shall pay sales, consumer, use and similar taxes for the Work 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 Contractor shall secure and pay for the building permit as well as 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 and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect 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 determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that 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 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 of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect 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 or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information 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.

§ 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 Architect's approval. The Architect'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 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 perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 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 Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is 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 Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner 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 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 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 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 and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

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

§ 3.13 Use of Site

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.

§ 3.14 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 or Separate Contractors by cutting, patching, or otherwise altering such construction, or by

excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, 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 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 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 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 or Architect. 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.

§ 3.18 Indemnification

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

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 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.

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The 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. The 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.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor 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 Contractor 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 Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 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. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or 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.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 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 Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

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

§ 4.2.12 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 rendered in good faith.

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

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests 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.

§ 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 a Separate Contractor or the subcontractors of a Separate Contractor.

§ 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 Owner 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 Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner 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 or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner 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 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 and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

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

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

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

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

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. 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 separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term “Contractor” in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner’s own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 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 and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor’s construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor’s Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor’s Work. Failure of the Contractor to notify 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 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 Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor 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 a Separate Contractor’s delays, improperly timed activities, damage to the Work or defective construction.

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

§ 6.2.5 The Owner and each Separate Contractor 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, 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 Architect will allocate the cost among those responsible.

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

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

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

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

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect 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 Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

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

§ 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 Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 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 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 Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's 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 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 Architect will 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 Architect 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 Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

§ 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 or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect 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.

§ 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 Architect 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 Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect 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 or Architect require, such as copies of requisitions, and releases and waivers of liens 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 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

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor 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 Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, 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 entitled to payment in the amount certified. The foregoing representations 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 Architect. However, the issuance of a Certificate for Payment will not be a representation that the 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 Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The 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 previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from 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;
- .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 withholds certification for payment under Section 9.5.1.3, 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 Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the 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 Architect 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 Architect and Owner 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 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 Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after 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 Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that 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 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 Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, 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 to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare 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 shall 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.

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

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

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's 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 Architect's final 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 (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. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the 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 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.

§ 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.

§ 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; and
- .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.

§ 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 and 10.2.1.3 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 and 10.2.1.3. 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 or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either 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 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 and Substances

§ 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 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 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 and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor 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, Architect, 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 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.

§ 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, 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 to the Owner 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

§ 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 the Contractor 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 to the Contractor 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 Architect and Architect's consultants; and (3) 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 Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 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 and Architect 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 Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the 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.

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's 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 Architect has not specifically requested to examine prior to its being covered, the 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 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 Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, 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 or Architect, the Owner may correct it in accordance with Section 2.5.

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

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 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.

§ 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, 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 Architect timely notice of when and where tests and inspections are to be made so that the 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 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 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 Architect of when and where tests and inspections are to be made so that the 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 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 Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the 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.

§ 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 Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, 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 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 Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities 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 and the 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, 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 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 be certified by the Initial Decision Maker, upon application, 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 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 the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of 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.

§ 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 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.

§ 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

§ 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 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 after 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

§ 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.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Use of premises.
4. Owner's safety and security.
5. Owner's occupancy requirements
6. Owner-furnished products.
7. Specification formats and conventions.

- B. Related Sections include the following:

1. Division 01 Section "Payment Procedures" for limitations and procedures governing temporary use of Owner's facilities.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification.

1. Project: Colleton County – CCMS – Mechanical Replacement; LS3P Project No. 1201-240076.
2. Location: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488
3. Owner: Colleton County School District:
 - a. Main Office: 500 Forest Circle, Walterboro, SC 29488.
 - b. Office of Buildings and Grounds: 246 Beach Road, Walterboro, SC 29488.
 - 1) Owner's Representative: Mr. Eric Hamilton, Director of Building and Grounds; erichamilton@colleton.k12.sc.us.

- B. Scope of Work: Construction Documents shall be provided for mechanical renovation and replacement at Colleton County Middle School at 1379 Tuskegee Airmen Drive. The scope is limited to replacing the existing DOAS unit in the 7th and 8th grade wing with a new ERU. The new unit will be a packaged DX-type unit with heating and cooling designed to dehumidify the outside air. The existing exhaust system will be modified to route the exhaust air back to the energy recovery unit. Design services include architectural coordination for ceilings and roof penetrations, electrical coordination for the units, and structural coordination for the new unit as

needed.

- C. Architect Identification: The Contract Documents were prepared for Project by LS3P ASSOCIATES LTD., 205-1/2 King Street, Charleston, SC 29401; (843) 577-4444.
 - 1. Architect's Representative: Mrs. Kameron K. Quick, AIA; kameronquick@ls3p.com.
- D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:
 - 1. Structural Engineer: MMSA, Inc., 30 Patewood Drive, Suite 100, Office Park Patewood One, Greenville, SC 29615; (864) 331-1201
 - a. Structural Representative: Michael M. Simpson, P.E., msimpson@mmsa.com
 - 2. Mechanical, Electrical, Plumbing, Fire Protection Engineers: Dulohery Weeks, 7402 Hodgson Memorial Drive, Suite 100, Savannah, GA 31406; (912) 355-0235.
 - a. MEP-FP Engineer Representative: Robert E. Lafond, P.E., LEED AP, CxA.

1.4 WAGE REQUIREMENTS (DAVIS-BACON ACT)

- A. Davis - Bacon Act: Comply with the Davis-Bacon contract clauses stated in 29 CFR 5.5(a)(1) through (10) and Wage Rates, included at the end of this Section, which are incorporated into the contract for construction. Additional information regarding the application of Davis-Bacon labor standards is available at the U.S. Department of Labor Wage and Hour Division website at www.dol.gov/whd/recovery/. Website for latest and current Davis-Bacon Wage Rates: https://sam.gov/search/?index=dbra&page=1&pageSize=25&sort=-modifiedDate&sfm%5BsimpleSearch%5D%5BkeywordRadio%5D=ALL&sfm%5BsimpleSearch%5D%5BkeywordEditorTextarea%5D=&sfm%5Bstatus%5D%5Bis_active%5D=true

1.5 TYPE OF CONTRACT

- A. Project will be constructed under single prime contract.

1.6 USE OF PREMISES

- A. General: Contractor shall have limited use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Deliveries: Provide representative to receive all materials and offload at the job site. The Owner will refuse all deliveries to other locations.
- C. Safety and Security: Comply with Owner's requirements related to security and fire drills and alerts.
- D. Burning/Welding Operations: Comply with Owner's requirements related to Burning and Welding permits. Coordinate turning off of fire/smoke detection systems in affected areas.

Contractor shall be responsible for Fire Department response fees related to construction operations.

- E. Smoking: No smoking is allowed on the premises, except within 20 feet of the Contractor's job office trailer or as otherwise designated by Owner's representative.

1.7 WORK RESTRICTIONS

- A. On-Site Work Hours: Work shall be generally performed during normal working hours Monday through Saturday, and other times as authorized by Owner.
- B. Employee Behavior:
 - 1. Smoking and other tobacco use is not permitted on the premises.
- C. Smoking: No smoking is allowed.
- D. Burning: Not permitted.
- E. Employee Identification: The Contractor will provide identification tags or shirts identifying the name of the contractor/subcontractor. Personnel are required to use identification tags or wear a shirt identifying the name of the contractor/subcontractor at all times.
- F. Employee Screening: Contractor and subcontractors certify that a "drug-free workplace" will be provided as that term is defined in Section 44-107-30 of the South Carolina Code of Laws by complying with the requirements set forth in Title 44, Chapter 107.

1.8 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFCI) PRODUCTS

- A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:
 - 1. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
 - 2. Provide for delivery of Owner-furnished products to Project site.
 - 3. Upon delivery, inspect, with Contractor present, delivered items.
 - a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.
 - 4. Obtain manufacturer's inspections, service, and warranties.
 - 5. Inform Contractor of earliest available delivery date for Owner-furnished products.
- B. Contractor's Responsibilities: The Work includes the following, as applicable:
 - 1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
 - 2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
 - 3. Receive, unload, handle, store, protect, and install Owner-furnished products.
 - 4. Make building services connections for Owner-furnished products.
 - 5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
 - 6. Repair or replace Owner-furnished products damaged following receipt.
- C. Owner-Furnished/Contractor-Installed (OFCI) Products:

1. As indicated on Drawings.

1.9 OWNER-FURNISHED/OWNER-INSTALLED (OFOI) PRODUCTS

- A. The Owner will furnish and install products indicated.
- B. Contractor will coordinate power, services, and other aspects required for installation.
- C. Owner-Furnished/Owner-Installed (OFOI) Products:
 1. As indicated on Drawings.

1.10 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI/CSC's "MasterFormat 2004" numbering system.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience (Not Allowed): Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form provided in Project Manual.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance:
 - 1) During Bid Phase: Addenda.
 - 2) During Construction: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012500

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DOCUMENT 012500.1 – CONTRACTOR’S REQUEST FOR SUBSTITUTION FORM

Colleton County – CCMS – Mechanical
 Project: Replacement Project No.: 1201-240076
 To: LS3P ASSOCIATES LTD. Specification Section _____
205-1/2 King St., Charleston, SC 29401 Contractor: _____
 Attn.: Mrs. Kameron K. Quick, AIA Requested by: _____
 Phone: 843-577-4444 Phone: _____
 Fax: 843-722-4789 Fax: _____
 Email: kameronquick@ls3p.com Email: _____
 Reason for not providing specified item: _____

Savings to Owner for accepting substitution: _____
Specified Product/Fabrication Method
 (List name/description; model no.; manufacturer): _____

Required Information for <i>Specified</i> Product:	Attached:
Point by Point Comparative Product Data	<input type="checkbox"/>
Tests	<input type="checkbox"/>
Reports	<input type="checkbox"/>
Fabrication Drawings	<input type="checkbox"/>
Samples (Where Applicable)	<input type="checkbox"/>

Proposed Product/Fabrication Method
 (List trade name/description; model no.; manufacturer) : _____

Required Information for <i>Proposed</i> Product:	Attached:
Point by Point Comparative Product Data	<input type="checkbox"/> (Required)
Tests	<input type="checkbox"/>
Reports	<input type="checkbox"/>
Fabrication Drawings	<input type="checkbox"/>
Samples (Where Applicable)	<input type="checkbox"/>

List of Related Changes/Modifications: _____

Differences between proposed substitution
 and specified product: _____

Proposed product/fabrication No Yes: Explain _____

method
affects other parts of the Work

Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product as utilized for this project, except as noted herein.
- Qualifications of manufacturer, installer, and other specified parties meet the specified qualifications.
- Same special warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source for replacement parts, as applicable, is available as that specified.
- Proposed substitution does not affect dimensions and functional clearances, except as noted herein.
- Proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
- Failure of proposed substitution to produce indicated results will not be considered grounds for additional payment or time.

For the Contractor:

Submitted by: _____

Signed: _____

Firm: _____

Telephone: _____

Fax: _____

Email: _____

For the Manufacturer:

Submitted by: _____

Signed: _____

Firm: _____

Telephone: _____

Fax: _____

Email: _____

END OF CONTRACTOR'S REQUEST FOR SUBSTITUTION FORM

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on form included in Project Manual. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.8 EXTENSION OF TIME DUE TO WEATHER

- A. General: This article establishes conditions and procedures for amending the Contract Time when excess adverse weather conditions have repeatedly caused cancellation of schedule critical activities, resulting in delay to the Project.
- B. Definitions:
 1. Adverse Weather: Job site environmental conditions in which precipitation, or soil conditions resulting from precipitation, or ambient temperature conditions during

working hours preclude carrying out a Scheduled Critical Activity. The following conditions may be considered by the Architect in determining the extent of excess adverse weather conditions, depending upon the nature of the delayed project tasks:

- a. Precipitation greater than 0.1 inch of water equivalent per day.
 - b. Days on which the average air temperature does not exceed 40 degrees F.
 - c. Other weather conditions deemed hazardous by the Contractor.
2. Scheduled Critical Activity: Project tasks, the delay of which will directly result in a delay in the completion of the project.
 3. Excess Adverse Weather: Adverse weather occurring in excess of the normal, cumulative number of calendar days of adverse weather as listed below:

Month	Normal	Month	Normal
January	15	July	8
February	16	August	6
March	11	September	4
April	7	October	5
May	4	November	9
June	6	December	15
		Total Annual	

C. Claim for Extension of Time Due to Weather:

1. Contractor shall file claim for each month during which adverse weather occurs.
 - a. Attach copies of Contractor’s Daily Reports for each day of adverse weather, describing fully the weather conditions, schedule activities delayed, and reasons for the delay.
 - b. Include photographs where applicable for documenting soil conditions.
 - c. Attach copy of NCDC/NOAA Local Climatological Data report for given month, or other published U.S. or state monthly weather data acceptable to Architect.
2. Claim shall be filed for a calendar month by attaching the completed form to the Application for Payment submitted the following month.
3. Architect shall review and approve or take other action upon Contractor’s Claim for Extension of Time. Adjustment of Contract Time shall be made by a single Change Order prepared at project closeout.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012600

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SECTION 012900 - PAYMENT PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - a. Application for Payment forms with Continuation Sheets.
 - b. Submittals Schedule.
 - c. Contractor's Construction Schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange schedule of values consistent with format of AIA Document G703.
 - 3. 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. Owner's auditing code if different from above.
 - c. Description of the Work.
 - d. Name of subcontractor.
 - e. Name of manufacturer or fabricator.
 - f. Name of supplier.
 - g. Change Orders (numbers) that affect value.

- h. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Purchase Contracts: Provide a separate line item in the schedule of values for each Purchase contract. Show line-item value of Purchase contract. Indicate Owner payments or deposits, if any, and balance to be paid by Contractor.
9. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
10. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items, at Contractor's option.
11. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
12. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.
- B. Payment Application Times: Submit Application for Payment to Architect by the 15th of the month. The period covered by each Application for Payment is one month, ending on the 15th day before the date for each progress payment.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
- H. Application for Payment at Substantial Completion : After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Submittals that must precede or coincide with submittal of Application for Payment at Substantial Completion include the following:
1. Operation and Maintenance Data final submittal.

- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. AIA Document G715, "Supplemental Attachment" to Accord Certificate of Insurance 255.
 8. Evidence that claims have been settled.
 9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 10. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Administrative and supervisory personnel.
 - 3. Coordination drawings.
 - 4. Requests for Information (RFIs).
 - 5. Project Information Management System.
 - 6. Project meetings.
- B. Related Sections:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Startup and adjustment of systems.
 8. Project closeout activities.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Provide coordination drawings in accordance with the following requirements:
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - c. Indicate required installation sequences.
 - d. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
 2. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Architect determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.
 3. Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."
- B. Coordination Digital Data Files: Prepare coordination digital data files in accordance with the following requirements:
1. File Preparation Format: Same digital data software program, version, and operating system as the original Drawings.
 2. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
 3. Architect will furnish Contractor one set of digital data files of the Drawings for use in preparing coordination digital data files.
 - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to the Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

1.6 KEY PERSONNEL

- A. Key Personnel Names: Within **15** days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
1. Include the names of the following inspectors as applicable, in accordance with schedule of inspections list and personnel approved by Owner and Authorities Having Jurisdiction:
 - a. Independent building inspectors
 - b. Special Inspectors
 2. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.7 REQUESTS FOR INFORMATION (RFIS)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI via the Project Information Management System.
1. Architect will not respond to RFIs submitted to Architect by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation. Attachments shall be electronic files in Acrobat PDF format.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Form bound in the Project Manual.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow **seven** working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs not be reviewed:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within **10** days of receipt of the RFI response.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within **seven** days if Contractor disagrees with response.
- F. RFI Log: The Project Information Management System will create and maintain the RFI log.
- 1.8 WEB-BASED PROJECT INFORMATION MANAGEMENT SYSTEM
- A. The Architect has established a web-based Project Information Management System to facilitate communication and record-keeping during the project. Architect will provide access to Contractor's key personnel. Refer to www.NewForma.com.
1. Use Architect's web-based Project Information Management System for purposes of managing project communication and documentation until Final Completion.
 2. Due to the size restrictions on email communication, all electronic files must be submitted through NewForma. Architect assumes no responsibility for information not received by Contractor's failure to use NewForma and such loss or delay of information will not be considered as a delay claim.
- B. Project Information Management System shall include the following functions:
1. Project directory.
 2. Project correspondence.
 3. Meeting minutes.
 4. Contract modifications forms and logs.
 5. RFI forms and logs.
 6. Submittals forms and logs.
 7. Task and issue management.
 8. Photo documentation.
 9. Schedule and calendar management.
 10. Payment application forms.
 11. Drawing and specification document hosting, viewing, and updating.
 12. Online document collaboration.
 13. Reminder and tracking functions.
 14. Archiving functions.

- C. Contractor, subcontractors, and other parties granted access by Contractor to Project Information Management System shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

1.9 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. The Superintendent shall represent the General Contractor at Project Meetings.
 2. Attendees: Inform participants and others involved, including inspectors, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 3. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 4. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Use of the premises.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Parking availability.
 - r. Office, work, and storage areas.
 - s. Equipment deliveries and priorities.
 - t. Security Program and First Aid.
 4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

- C. Project Closeout Conference: Schedule and conduct a Project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for demonstration and training.
 - f. Preparation of Contractor's punch list.
 - g. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - h. Submittal procedures.
 - i. Owner's partial occupancy requirements.
 - j. Installation of Owner's furniture, fixtures, and equipment.
 - k. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- D. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Access.
 - 6) Site utilization.
 - 7) Temporary facilities and controls.

- 8) Progress cleaning.
 - 9) Quality and work standards.
 - 10) Status of correction of deficient items.
 - 11) Field observations.
 - 12) Status of RFIs.
 - 13) Status of proposal requests.
 - 14) Pending changes.
 - 15) Status of Change Orders.
 - 16) Pending claims and disputes.
 - 17) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013100

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SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Site condition reports.

1.3 DEFINITIONS

- A. General: Refer to glossary of terms in AGC's "Construction Planning & Scheduling" for terminology used in this section.
- B. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.4 INFORMATIONALSUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Architect's final release or approval.
- B. Preliminary Construction Schedule: Submit two printed copies; one a single sheet of reproducible media, and one a print.
- C. Preliminary Network Diagram: Submit two printed copies; one a single sheet of reproducible media, and one a print; large enough to show entire network for entire construction period.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

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1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 3. Total Float Report: List of activities sorted in ascending order of total float.
 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- F. Daily Construction Reports: Submit one copy at weekly intervals.
- G. Site Condition Reports: Submit one copy at time of discovery of differing conditions.
- H. Qualification Data: For scheduling consultant and for firms and persons specified in "Quality Assurance" Article. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- 1.5 COORDINATION
- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
1. Secure time commitments for performing critical elements of the Work from entities involved.
 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.
- 1.6 SUBMITTALS SCHEDULE
- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules. Provide licensed copy of software for Owner's use upon request.
- C. Time Frame: Extend schedule from date established for the Notice of Award to date of Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 30 days, unless specifically allowed by Architect.
 - 2. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 - 3. Startup and Testing Time: Include no fewer than 14 days for startup and testing.
 - 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Phasing: Arrange list of activities on schedule by phase.
 - 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 - 3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 - 4. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 - 5. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Use-of-premises restrictions.
 - e. Provisions for future construction.
 - f. Seasonal variations.
 - g. Environmental control.
 - 6. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.

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- f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
 - 7. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.
 - F. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
 - 1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.
 - G. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Final Completion percentage for each activity.
 - H. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.
- 1.8 PRELIMINARY CONSTRUCTION SCHEDULE
- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.
 - B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

1.9 CPM SCHEDULE REQUIREMENTS

- A. Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Purchase of materials.
 - c. Delivery.
 - d. Fabrication.
 - e. Installation.
 - 2. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 - 3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 - 1. Contractor or subcontractor and the Work or activity.
 - 2. Description of activity.
 - 3. Main events of activity.
 - 4. Immediate preceding and succeeding activities.
 - 5. Early and late start dates.
 - 6. Early and late finish dates.

7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

1.10 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. High and low temperatures and general weather conditions, including presence of rain or snow.
 5. Accidents.
 6. Meetings and significant decisions.
 7. Unusual events (refer to special reports).
 8. Exposure of installed materials to water infiltration.
 9. Visible signs of mold.
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Change Orders received and implemented.
 15. Construction Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.

18. Partial completions and occupancies.
 19. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013200

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SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Periodic construction photographs.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.

1.3 INFORMATIONALSUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Construction Photographs: Submit one sets of prints of each digital image within seven days of taking photographs.
 - 1. Format: 4-by-6-inch smooth-surface matte prints on single-weight, paper; enclosed back to back in clear plastic sleeves punched for three-ring binder.
 - 2. Identification: On back of each print, label with the following information:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - 3. Digital Images: Submit a complete set of digital image electronic files with each submittal of prints. Identify electronic media with date photographs were taken. Submit images that have the same aspect ratio as the sensor, uncropped.

1.4 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.
 - 1. Contractor's staff may be approved by Architect upon advance written request.

1.5 COORDINATION

- A. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities including temporary lighting.

1.6 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPEG format, with minimum sensor size of 2.0 megapixels, and at an image resolution of not less than 1024 by 768 pixels.

1.7 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
- C. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs the same as for those submitted to Architect.
- D. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in filename for each image.
 - 2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.
- E. Periodic Construction Photographs: Take 6 color photographs weekly with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013233

SECTION 013300 - ELECTRONIC SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Electronic Files Transfer: All submittals which contain electronic files shall be submitted through the Architects Newforma web site. The address and or link will be provided at or before the initial preconstruction conference. The Architect assumes no responsibility for information lost or not received by Contractors failure to submit through the newforma web site.
 - 1. Due to restrictions on size of documents that can be received through e-mail the use of the newforma site is required. Failure to comply shall be at the contractors own risk and transmissions lost or not received will not apply or be considered in any delay claim associated with lost/missing or missed information.
- B. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making

corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

- B. Table of Contents (TOC) for Project Close Out.: Submit a TOC of submittals, arranged in Division/Section order as listed in the Project Manual.
1. Provide Table of Contents for Project Close Out document to the Architect for review, within 90 days of Notice to Proceed.
 2. Failure to submit TOC: Architect may not approval Contractor's payment request or recommend to Owner to withhold a portion of the funds requested until TOC document has been submitted.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Construction Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Construction Manager, through Architect, before being returned to Contractor.

- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01. A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect and Construction Manager.
 4. Transmittal Form for Electronic Submittals: Use software-generated form from electronic project management software acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Names of subcontractor, manufacturer, and supplier.
 - h. Category and type of submittal.
 - i. Submittal purpose and description.
 - j. Specification Section number and title.
 - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - l. Drawing number and detail references, as appropriate.

- m. Location(s) where product is to be installed, as appropriate.
 - n. Related physical samples submitted directly.
 - o. Indication of full or partial submittal.
 - p. Transmittal number, numbered consecutively.
 - q. Submittal and transmittal distribution record.
 - r. Other necessary identification.
 - s. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
- a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Post electronic submittals as PDF electronic files directly to Project Management Information System specifically established for Project.
 - a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Submit electronic submittals via email as PDF electronic files.
 - a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.

B. Processing Time:

1. Initial Review: 15 days.
2. Resubmittal Review: 15 days.
3. Sequential Review: 21 days.
4. Concurrent Consultant Review: 15 days.

2.2 DELEGATED-DESIGN SERVICES

- A. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

2.3 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Mark with approval stamp before submitting to Architect.

END OF SECTION 013300

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DIGITAL DATA LETTER OF AGREEMENT

An Agreement between LS3P ASSOCIATES LTD. (the "Architect") and ___ (the "Licensee," either Original or Third Party, as the case may be) for Licensing of Digital Data

Architect: LS3P ASSOCIATES LTD.
205-1/2 King Street
Charleston, SC 29401
Contact: Mrs. Kameron K. Quick, AIA

Licensee:
Original ___
3rd Party ___

Project No.: 1201-240076
Project Name: Colleton County – CCMS - Mechanical Replacement
Location: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488
Date: _____

The Architect will provide the following Digital Data, dated as of the particular transmission, to the Licensee **for information purposes only:**

Sheet XXX (.dwg format)
Sheet XXX (.dwg format)
Sheet XXX (.dwg format)
Sheet XXX (.dwg format)

Revit MODEL (Revit 20XX)

Digital Data was prepared using the following:

Software: Revit (.rvt) **Version:**

Digital Data to be delivered via the following media: Newforma Website posting

Licensee shall pay the Architect a service fee of \$0.00 and other good and valuable consideration.

TERMS AND CONDITIONS

1. The Architect and its consultants make no representation as to the compatibility of the Digital Data with any hardware or software. The Licensee shall notify the Architect within five (5) business days of any problems associated with accessing and/or using the Digital Data.
2. The Licensee acknowledges and agrees that the Digital Data may change or degrade during the transmission process. The Licensee acknowledges and agrees that the Architect and its consultants may remove all indications of ownership from the Digital Data prior to transmission.
3. All Digital Data shall be considered the property of the Architect and/or its consultants and shall not be used for other Projects, for additions to this Project without the prior written permission of the Architect and/or its consultants. Digital Data shall not be re-transmitted by the Original Licensee to a Third-Party Licensee without prior execution of an agreement identical to this Agreement between the Architect, the Original Licensee, and the Third-Party Licensee. Under no circumstances shall the transmission of the Digital Data be considered a sale of goods or a sale of copyrights.

4. **THE ARCHITECT AND THE ARCHITECT'S CONSULTANTS HEREBY EXPRESSLY DISCLAIM ANY AND ALL WARRANTIES, BOTH EXPRESS AND IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AS WELL AS ANY WARRANTY OF ACCURACY, COMPLETENESS, AND/OR PERMANENCE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.** Addenda information and/or revisions made to the most current Digital Data after any date of transmission have not been incorporated into the transmitted Digital Data. In the event of a conflict between the Architect's printed instruments of service (2D Documents) whether sealed or unsealed) and the Digital Data (3D Model), the printed instruments of service shall govern. The Licensee acknowledges and agrees that the duty to determine the existence of any and all conflicts between the Digital Data and any other information upon which the Licensee relies rests solely upon the Licensee. The Digital Data shall not be considered Contract Documents or Construction Documents as defined by any General Conditions of Contract for Construction. The Digital Data is being provided for information only and on a strictly "AS IS" basis.
5. Licensee agree the extent of its reliance on any Digital Data shall be limited to the uses identified in this Agreement.
6. Licensee may use and rely upon the Digital Data only for programming, site analysis, design review, 3D coordination of structural, mechanical, plumbing, and electrical systems, and preconstruction activities.
7. The Level of Development (LOD) describes the minimum dimensional, spatial, quantitative, qualitative, and other data included in the Digital Data to support the uses and reliance included in this Agreement. The LOD of the Digital Data transmitted is LOD 200. LOD 200 is defined as model and model elements that are generically and graphically represented within the Digital Data with approximate quantity of major components, size, shape, location, and orientation.
8. If Licensee discovers or becomes aware of any discrepancies, inconsistencies, errors, or omissions in any Digital Data transmitted, they shall promptly report the discrepancy, inconsistency, error, or omission in writing to the Architect. Licensee shall not use any discrepancy, inconsistency, error, or omission in the Digital Data as the basis of a claim.
9. Any reliance on the Digital Data not in accordance with this Agreement shall be at the sole risk of the Licensee.
10. The use and/or provision of the Digital Data prepared by the Architect and/or its consultants shall not in any way reduce or obviate the Licensee's duty to check and coordinate dimensions, details, and quantities of materials as required to facilitate construction of the Project in a complete and quality manner consistent with the applicable standards of care. Confirmation of existing conditions is the sole responsibility of the Licensee.
11. The Licensee agrees to the extent permitted by applicable law, to indemnify, hold harmless, and release the Architect and/or its consultants, their officers, shareholders, employees, and sub-consultants from any and all injuries, claims, demands, expenses, suits, liabilities, losses, damages, costs, disputes, other matters in question, third party claims, pass-through claims, subrogated claims, and/or claim expenses related to the Digital Data, including but not limited to, attorneys' fees, expert witness fees, and court costs arising out of or in any way related to or connected with any negligent act and/or omission in the generation, provision, and/or use of the Digital Data by the Licensee and/or any of its subcontractors, suppliers, and/or consultants and waive any and all rights to such claims and causes of action.
12. The Licensee waives damages against the Architect for any and all injuries, claims, losses, expenses, damages, disputes, other matters in question, and/or claim expenses arising out of or relating to this Agreement and/or generation, provision, and/or use of the Digital Data, including, but not limited to, consequential damages and reasonable attorneys' fees and defense costs.
13. The Architect's and/or the Architect's consultants' liability to the Licensee and/or any of its subcontractors, suppliers, and/or consultants for any and all injuries, claims, losses, expenses, damages, disputes, other matters in question, third party claims, pass-through claims, subrogated claims, and/or claim expenses arising out of or relating to this Agreement and/or the Digital Data, including, but not limited to, reasonable attorneys' fees and defense

costs, regardless of the nature of the claim or damage, shall not exceed, either individually or in the aggregate, the total amount of \$1,000.00. Such causes include, but are not limited to, the Architect's and/or the Architect's consultants' negligence, errors, omissions, strict liability, breach of contract, and/or breach of warranty.

14. To the best of the Architect's knowledge, information and belief, there are no licensing or copyright fees due to others based on the transmission of the Digital Data, but to the extent that such unknown fees do exist, the Licensee agrees to pay the required fees and hold the Architect and/or its consultants harmless from any associated costs or penalties.

15. Upon execution of this Agreement, the Architect grants to the Licensee a non-exclusive, non-transferable (except as set forth herein), limited license to use the Digital Data solely and exclusively for informational purposes on the identified Project only, provided that the Licensee substantially performs its obligations under this Agreement.

16. Any purchase order number provided by the Licensee is for the Licensee's accounting purposes only. The Licensee acknowledges and agrees that purchase order terms and conditions are null, void, and inapplicable to this Agreement.

17. This Agreement constitutes the entire agreement between the parties relative to the Digital Data and shall be governed by the laws of the State of South Carolina without regard to principles of conflicts of law.

AUTHORIZED ACCEPTANCE

by Architect:
LS3P ASSOCIATES LTD.

by Original Licensee:

Signature

Signature

Print Name and Title

Print Name and Title

Date

Date

by Third Party Licensee:

Signature

Print Name and Title

Date

WE SO CONSENT:

by Owner:

Signature

Print Name and Title

Date

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.
 - 1. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate aesthetic effects.
 - c. Demonstrate the qualities of products and workmanship.

- d. Demonstrate successful installation of interfaces between components and systems.
 - e. Perform preconstruction testing to determine system performance.
 2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- E. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- F. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- G. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- H. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- J. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- K. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.4 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as

appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONALSUBMITTALS

- A. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
 2. Entity responsible for performing tests and inspections.
 3. Description of test and inspection.
 4. Identification of applicable standards.
 5. Identification of test and inspection methods.
 6. Number of tests and inspections required.
 7. Time schedule or time span for tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Ambient conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- D. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following Contractor's responsibilities, including the following:
1. Provide test specimens representative of proposed products and construction.
 2. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 3. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 4. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
 5. When testing is complete, remove test specimens and test assemblies, laboratory mockups, and mockups; do not reuse products on Project.
 6. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups of size indicated.
 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 3. Notify Architect seven days in advance of 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 starting corresponding Work, fabrication, or construction.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed unless otherwise indicated.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Tests and inspections not assigned to Contractor will be furnished by Owner. Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. For tests and inspections indicated as the Contractor's responsibility, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractor's responsibility, Engage a qualified testing agency to perform quality-control services.
 - a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 4. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 5. Do not perform duties of Contractor.

- E. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- F. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. **Contractor's Associated Requirements and Services:** Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.
- H. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
 2. Do not install finishes until required inspection of concealed construction is completed and work approved.
 - a. Coordinate in-wall and above-ceiling inspection by authorities having jurisdiction and observation by Architect.
- I. **Schedule of Tests and Inspections:** Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.
1. **Distribution:** Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. **Special Tests and Inspections:** Owner will engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.

3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. . Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

ATTACHMENT: STATEMENT OF SPECIAL INSPECTIONS

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STATEMENT OF SPECIAL INSPECTIONS

Project: Colleton County - CCMS - Mechanical Replacement; 1201-240076 Application No. _____

Project Location: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488

Project Owner: Colleton County School District

Address: 500 Forest Circle, Walterboro, SC 29488

SC Registered Design

Professional in Responsible Charge: Mrs. Kameron K. Quick, AIA

Firm (optional): LS3P ASSOCIATES LTD.

License Number: SC 9811 Phone: (843) 577-4444 Fax: (843) 722-4789

Address: 205-1/2 King Street, Charleston, SC 29401

Project Architect: Mrs. Kameron K. Quick, AIA

Firm (optional): LS3P ASSOCIATES LTD.

License Number: SC 9811 Phone: (843) 958-5493 Fax: 843) 722-4789

Address: 205-1/2 King Street, Charleston, SC 29401

Project Structural Engineer: Michael M. Simpson, P.E.

Firm (optional): Michael M. Simpson + Associates, Inc. (MMSA, Inc.)

License Number: SC 16718 Phone: (864) 331-1201 Fax: (864) 331-1070

Address: 30 Patewood Drive, Suite 100, Office Park Patewood One, Greenville, SC 29615

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection requirements of the International Building Code. It includes a Schedule of Special Inspection Services applicable to this project as well as the name of the Special Inspector(s) and the identity of other approved agencies that are to be retained for conducting these inspections.

The Special Inspector shall keep records of all inspections and shall furnish inspection reports to the Design Professional in Responsible Charge and the Building Official. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Design Professional in Responsible Charge and the Building Official. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Occupancy.

Job site safety and means and methods of construction are solely the responsibility of the Contractor.

Prepared by:

Mrs. Kameron K. Quick, AIA

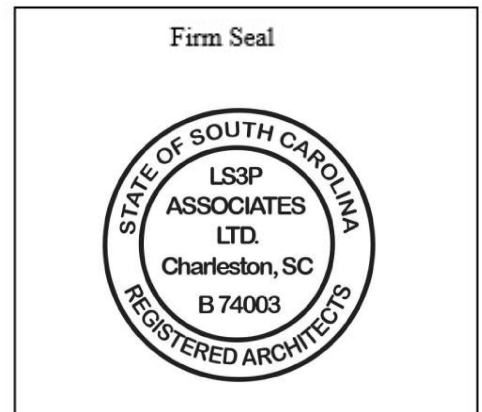
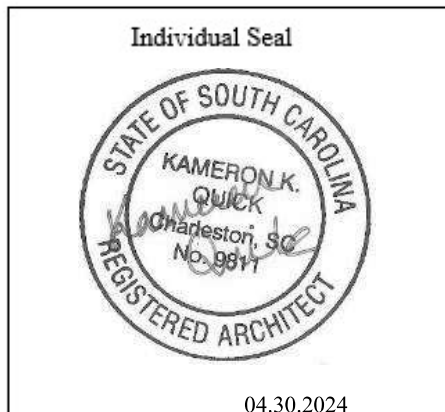
Type or print name

Kameron Quick  4/30/2024
Signature Date

Accepted by:

Type or print name

Signature Date



CONTRACTOR'S STATEMENT OF RESPONSIBILITY

FOR WORK REQUIRING SPECIAL INSPECTIONS, STRUCTURAL OBSERVATIONS AND CONSTRUCTION MATERIAL TESTING IN ACCORDANCE WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.

Pursuant to Section 1704, Chapter 17 of the 2021 International Building Code, the contractor identified herein is responsible for the construction of main wind or seismic force resisting system, designated seismic system or wind or seismic resisting components listed in the statement of special inspections of this project and; is hereby submitting this statement of responsibility to the building official of the jurisdiction having authority over this permit and to the owner of this project.

Permit No: _____

Project Address: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488

Please check if you are the owner of this project and also acting as the contractor/builder (owner-builder)

Contractor's Company Name: _____

State of South Carolina Contractor's License Number: _____ Expiration Date: _____

Name (Type or Print): _____
(First) (M.I.) (Last)

Title/ Position in the Contractor's/Builder's Organization: _____

Mailing Address: _____

Email: _____ Phone: _____

1. I acknowledge and am aware of special requirements contained in the statement of special inspections
2. I acknowledge that control will be exercised to obtain conformance with the construction documents approved by the building official
3. I will have in place procedures for exercising control within our (the contractor's/builder's) organization for the method and frequency of reporting and the distribution of the reports
4. I certify that I will have a qualified person within our (the contractor's/builder's) organization to exercise such control

Signature: _____

Date: _____

OWNER'S ACKNOWLEDGEMENT OF SPECIAL INSPECTIONS

Project Name: Colleton County - CCMS - Mechanical Replacement; 1201-240076

Project Address: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488

Owner's Name/Company: Colleton County School District

Owner's Address: Main: 500 Forest Cir, Walterboro, SC 29488; Office of Bldgs & Grounds: 246 Beach Rd., Walterboro 29488

Owner's Phone: (843) 782-4523, ext. 41300 Owner's Fax: (843) 539-1094

Owner's Email: erichamilton@colleton.k12.sc.us

SC Registered Design Professional: Mrs. Kameron K. Quick, AIA

License Number: SC 9811 Phone: (843) 577-4444 Fax: (843) 722-4789

Address: LS3P ASSOCIATES LTD., 205-1/2 King Street, Charleston, SC 29401

Email: kameronquick@ls3p.com

By signing this acknowledgement I understand that the SC Registered Design professional in charge and all SC registered special inspectors are hired by myself being listed as the owner of the above referenced project at the above reference address and/or my authorized agent as approved by the building official pursuant to the International Building Code Section 1704 and the South Carolina Building Codes Council.

Signature

Date

Print Name

CHECKLIST OF REQUIRED SPECIAL INSPECTION REPORTS & INDIVIDUALS PERFORMING INSPECTIONS

Project Colleton County - CCMS - Mechanical Replacement; 1201-240076 Application No. _____

Project location: Colleton County Middle School, 1379 Tuskegee Airmen Drive, Walterboro, SC 29488

- Concrete** IBC Table 1705.3
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Exterior Insulation and Finish Systems (EIFS)** IBC Section 1705.17
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Fabricator** ISO 9000 Lead Quality Assurance Auditor. IBC 1704.2.5
Accrediting Agency: _____ Phone: _____
- Metal Building Fabrication**
Accrediting Agency: _____ Phone: _____
- Precast Concrete Fabrication**
Accrediting Agency: _____ Phone: _____
- Prefabricated Trusses**
Accrediting Agency: _____ Phone: _____
- Steel Bar Joist Fabrication**
Accrediting Agency: _____ Phone: _____
- Structural Steel Fabrication**
Accrediting Agency: _____ Phone: _____
- Masonry** IBC 1705.4
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Mastic and Intumescent Fire-Resistant Coatings** IBC Section 1705.16
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____

- Site Welding** IBC Table 1705.2.2
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Soils** IBC Sections 1705.6 through 1705.9
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Fill Placement** IBC 1803.5.8
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Driven Deep Foundations** IBC 1705.7
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Cast In Place Deep Foundations** IBC Section 1705.8
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Helical Pile Foundations** IBC Section 1705.9
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Special Cases** IBC Section 1705.1.1
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Fire-resistant Penetrations and Joints** IBC Section 1705.18
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Special Inspection for Smoke Control** IBC Section 1705.19
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Special Inspections for Seismic Resistance** IBC Section 1705.13
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____
- Structural Steel** IBC Section 1705.13.1
Individual Name: _____ Phone: _____
SC Registration Number: _____ Classification: _____

Structural Wood IBC Section 1705.13.2

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Cold Formed Steel Light Framing IBC Section 1705.13.3

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Storage Racks IBC Section 1705.13.7

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Architectural Components and Access Floors IBC Section 1705.13.5 and 1705.13.5.1

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Plumbing, Mechanical and Electrical Components IBC Section 1705.13.6

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Designated Seismic System Verification IBC Section 1705.13.4

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Sprayed Fire Resistance Materials IBC Section 1705.15 through 1705.15.6

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Steel Frame IBC Table 1705.2.1

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

High Strength Bolts AISC 360

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Structural Observations IBC Section 1704.6 (Risk Category III & IV or over 75')

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Testing and Qualification for Seismic Resistance IBC Section 1705.14

Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Structural Steel IBC Sections 1705.13.1 as required by 1705.14.1
Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Seismic Certification of Nonstructural Components IBC Section 1705.14.2 as required by 1705.14
Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Seismic Isolation Systems IBC Section 1705.14.4 as required by 1705.14
Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Wood Construction IBC 1705.5
Individual Name: _____ Phone: _____

SC Registration Number: _____ Classification: _____

Prepared by: Mrs. Kameron K. Quick, AIA SC License No. 9811

Approved by: _____ Date _____

FINAL REPORT OF SPECIAL INSPECTIONS

Project: _____ Application No.: _____

Project location: _____

Project Owner: _____

Address: _____

SC Registered Design
Professional in Responsible Charge: _____

Firm (optional): _____

License No.: SC _____ Phone: _____ Fax: _____

Address: _____

To the best of my information, knowledge, and belief, the Special Inspections and/or Testing requirements for this project, and designated for this Agent in the *Checklist of Required Inspection Reports*, *Checklist of Quality Assurance Plan* and the *Checklist of Required Testing* submitted for permit, have been completed in accordance with the contract documents.

Interim reports submitted prior to this *Final Report of Inspections* form a basis for, and are to be considered an integral part of this Final Report. All discrepancies that were outstanding in all of the Interim reports have been corrected.

Prepared by:

Type or print name

Firm (optional)

Signature

Date

Individuals Seal

Firm Seal

SPECIAL INSPECTOR QUALIFICATIONS

INTRODUCTION

This policy sets forth the minimum qualification requirements for individuals and firms offering Special Inspection services. Nothing in this policy prevents the project owner or the registered design professional in responsible charge, acting as the owner's agent, from requiring qualifications above those identified herein.

An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and/or inspections.

Firms offering special inspection services for projects and fabrications located in South Carolina shall be licensed, registered, or certified by either; the South Carolina Board of Architectural Examiners, the South Carolina Contractors Licensing Board or the South Carolina Board of Professional Engineers and Land Surveyors in accordance with South Carolina Code of Laws, Title 40, Chapter 26.

Any questions or correspondence regarding special inspections should be directed to the building official for the jurisdiction in which the project will be located.

This Special Inspection Policy in no way relieves any participant from the proper performance of work according to contract documents and applicable codes, standards and regulation.

INSPECTION OF FABRICATORS

Fabrication and Implementation Procedures

ISO 9000 Lead Quality Assurance Auditor and meet the applicable special inspector qualification requirements identified herein

Fabricator Approval

ISO 9000 Lead Quality Assurance Auditor and meet the applicable special inspector qualification requirements identified herein

The following fabricator certifications are considered sufficient.

Metal Building Fabrication

Current American Institute of Steel Construction - Metal Building Systems Certification

Precast Concrete Fabrication

Current National Precast Concrete Association Plant Certification

Prefabricated Trusses

Current Truss Plate Institute Certification

Steel Bar Joist Fabrication

Current Steel Joist Institute Certification

Structural Steel Fabrication

Current American Institute of Steel Construction - Conventional Steel Building Structures

Current American Institute of Steel Construction - Complex Steel Building Structures

Current American Institute of Steel Construction - Simple Steel Bridges

Current American Institute of Steel Construction - Major Steel Bridges

QUALIFICATION OF SPECIAL INSPECTORS

The special inspector shall be a qualified person licensed in accordance with the requirements of the State of South Carolina Labor, Licensing and Regulation Department. The qualifications of all personnel new to an agency shall be provided to and approved by the building official before being assigned to any project.

Except for professional engineers and architects registered in the State of South Carolina, special inspectors shall have a license. The following is the current minimum requirements to obtain a license.

Steel Construction

Welding

Current American Welding Society (AWS) Certified Welding Inspector or Current

Canadian Welding Bureau Certified Welding Inspector

Nondestructive Testing of Welds

Current Nondestructive Testing Level II or III (Magnetic Particle Testing, Liquid Penetrate Testing, Ultrasonic Testing or Radiographic Testing)

(1) Level II personnel shall be qualified in accordance with the American Society of Nondestructive Testing (ASNT) to perform Magnetic Particle Testing, Liquid Penetrant Testing and Ultrasonic Testing, or

(2) Level II certification as certified by a Level III examiner to perform Magnetic Particle Testing, Liquid Penetrant Testing and Ultrasonic Testing. Level III Examiner shall be certified by ASNT and must submit a copy of his certification with the Level II certification.

Steel Frame Inspection/High-Strength Bolting

Current International Code Council (ICC) Structural Steel and Bolting Inspector

Concrete Construction Reinforced

Concrete

Current ICC Reinforced Concrete Special Inspector or

South Carolina Engineer in Training (EIT) with one year related experience under supervision of a licensed PE

Prestressed Concrete - Pretension tendons

Current ICC Reinforced Concrete Certification or

South Carolina Engineer in Training (EIT) with one year related experience under supervision of a licensed PE

Prestressed Concrete - Post-tension tendons

Current Post-Tensioning Institute (PTI) Certification Level I or
South Carolina Engineer in Training (EIT) with one year related experience under supervision of a licensed PE

Prestressed Concrete - Post-Tension Slabs-on-Ground

Current PTI Certification Level I or
South Carolina Engineer in Training (EIT) with one year related experience under supervision of a licensed PE

Precast Concrete Erection

The special inspector shall be registered for Reinforced Concrete or Welding as required based on the type of inspection being performed

Structural Masonry Construction

Current ICC Structural Masonry certificate and one year related experience or
South Carolina Engineer in Training (EIT) with one year related experience including plan reading under supervision of a licensed PE

Modular Retaining Walls

South Carolina Engineer in Training (EIT) with one year related experience under supervision of a licensed PE

Soils**Excavation and Filling/Verification of Soils**

Current National Institute for Certification in Engineering Technologies (NICET) Level II certification in geotechnical engineering technology/construction or
Current NICET Level II in soils or
South Carolina Engineer in Training (EIT) with one year related experience under supervision of a licensed PE
or
Soils Special Inspector or
Current SCDOT Earthwork, Drainage and Base Certification

Deep Foundations

Current NICET Level II certification in geotechnical engineering technology/construction or
South Carolina Engineer in Training (EIT) with one year related experience under supervision of a licensed PE
or
Current SCDOT Foundation Inspector Certification

Sprayed Fire-Resistant Materials

Current ICC Spray-Applied Fire Proofing certificate

Smoke Control

Current NICET N-II-FPAS or

Current NICET N-II-FPFA or

Current National Environmental Balancing Bureau or

Current Associated Air Balance Council

Exterior Insulation And Finish System

South Carolina EIT with one year related experience

Special Cases

Approval on a case-by-case basis

Contractor's Statement of Responsibility

Each contractor responsible for the construction of a main wind force or seismic force resisting system, designated, seismic system or a wind or seismic resisting component listed in the statement of special inspections shall submit a Statement of Responsibility. The statement shall be submitted prior to the commencement of work on the system or component.

Project:

Contractor's Name:

Address:

License No.:

Description of designated building systems and components included in the Statement of Responsibility:

Contractor's Acknowledgment of Special Requirements

I hereby acknowledge that I have received, read, and understand the special requirements contained in the statement of special inspections.

I hereby acknowledge that control will be exercised to obtain conformance with the construction documents approved by the Building Official.

Signature

Date

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Fabricator's Certificate of Compliance

Each approved fabricator that is exempt from Special Inspection of shop fabrication and implementation procedures per section 1704.2.5 of the International Building Code must submit a *Fabricator's Certificate of Compliance* at the completion of fabrication.

Project:

Fabricator's Name:

Address:

Certification or Approval Agency:

Certification Number:

Date of Last Audit or Approval:

Description of structural members and assemblies that have been fabricated:

I hereby certify that items described above were fabricated in strict accordance with the approved construction documents.

Signature

Date

Title

Attach copies of fabricator's certification or building code evaluation service report.

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SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CRD	Handbook for Concrete and Cement Available from Army Corps of Engineers Waterways Experiment Station www.wes.army.mil	(601) 634-2355
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil/	(215) 697-6257
	Available from General Services Administration www.apps.fss.gsa.gov/pub/fedspecs/index.cfm	(202) 619-8925
	Available from National Institute of Building Sciences www.nibs.org	(202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-5434

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 014200

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SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Sewers and drainage.
 - 2. Water service and distribution.
 - 3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
 - 4. Heating and cooling facilities.
 - 5. Ventilation.
 - 6. Electric power service.
 - 7. Lighting.
 - 8. Telephone service.
 - 9. Wireless connectivity
- C. Support facilities include, but are not limited to, the following:
 - 1. Temporary roads and paving.
 - 2. Dewatering facilities and drains.
 - 3. Project identification and temporary signs.
 - 4. Waste disposal facilities.
 - 5. Field offices.
 - 6. Storage and fabrication sheds.
 - 7. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Temporary enclosures.
 - 3. Temporary partitions.
 - 4. Fire protection.

1.2 DEFINITIONS

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

1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
 - 1. Owner's construction forces.
 - 2. Occupants of Project.

3. Architect.
 4. Testing agencies.
 5. Personnel of authorities having jurisdiction.
- B. Sewer Service: Pay sewer service use charges for sewer usage, by all parties engaged in construction, at Project site.
- C. Water Service: Pay water service use charges, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site.
- D. Electric Power Service: Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site.

1.4 SUBMITTALS

- A. Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- B. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.5 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
 2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.
 - 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
 - 1. Keep temporary services and facilities clean and neat.
 - 2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- C. Water: Potable.

2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- D. Self-Contained Portable Handwashing Stations: With soap and paper towel dispenser(s).
- E. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.
- F. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

- G. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- H. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

3.2 SITE USE PLAN

- A. Contractor shall confine operations within the areas indicated and as shown on the site use plan and as permitted by law, ordinances, and permits. Site shall not be unreasonably encumbered with materials, products, or construction equipment.
- B. The Contractor in reviewing the use of the site shall include access to proposed building for construction purposes, parking where possible for employees, temporary facilities including offices, storage, and workshop sheds or portable trailers, utility hookups, staging areas, storage materials and products, and unloading space.
- C. The Contractor shall show additional area needed in the Contractor's use of the site beyond that which may be indicated on the Drawings. Where additional fencing is required, such fencing shall be included at no additional cost to the Owner.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage

facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.

1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
 2. Connect temporary sewers to municipal system as directed by sewer department officials.
 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
 - a. Provide safety showers, eyewash fountains, and similar facilities where required by authorities having jurisdiction.
 3. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
1. Maintain a minimum temperature of 50 deg F in permanently enclosed portions of building for normal construction activities, and 65 deg F for finishing activities and areas where finished Work has been installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- G. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities. Install separate telephone line for each field office and first-aid station.
1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.

2. Provide superintendent with a cellular telephone or portable 2-way radio when away from field office.

H. Electronic Communication Service: Provide wireless connectivity in the primary field office adequate for use by Architect, Owner and project team's wireless devices to access project electronic documents and maintain electronic communications.

3.4 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Dewatering Facilities and Drains: Comply with requirements in applicable Division 31 Sections for temporary drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent Work or temporary facilities.
2. Before connection and operation of permanent drainage piping system, provide temporary drainage where roofing or similar waterproof deck construction is completed.
3. Remove snow and ice as required to minimize accumulations.

C. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.

1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details attached at the end of this Section.
2. Prepare temporary signs to provide directional information to construction personnel and visitors.

D. Directional Signage: Mount directional signage on pressure treated wood or galvanized steel posts and framing.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 01 Section "Execution Requirements" for progress cleaning requirements.

1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
2. Waste Disposal: Do not burn waste materials. Burning on the project site is not permitted. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully. Comply with regulations of authorities having jurisdiction.

- F. Janitorial Services: Provide janitorial services on a daily basis for temporary offices, first-aid stations, toilets, wash facilities, lunchrooms, and similar areas.
- G. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.
- H. Contractor(s) shall be responsible for protecting the site streets connecting to the project from deposits of mud, sand, stone, litter, or debris of any form. All mud collected on vehicle wheels must be cleaned off before leaving the construction area. Any mud or debris collecting on the streets from the construction project shall be removed immediately before becoming a traffic hazard or being carried into the surrounding buildings.
- I. Catch basins and storm drain lines in the vicinity of the site shall be protected from the entry of mortar, concrete to spoil, and other construction debris. The residue from the cleaning of ready-mix trucks, wheelbarrows, concrete buggies, etc. must be prevented from entering the drainage system, and if cleaning is done, it must be contained and residue removed from the site with other refuse. Comply with environmental protection requirements.
- J. Automobile parking on the site is restricted. Delivery trucks, contractor's vehicles, workmen's autos, and all other parking connected with the project must be within the project limits. No areas are available on site for those purposes outside of designated limits. Coordinate with the Owner parking availability.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- C. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
 - 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.
 - 2. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
 - 3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.

4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
 5. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire-retardant-treated material for framing and main sheathing.
- 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.
1. Construct dustproof partitions of not less than nominal 4-inch studs, 5/8-inch gypsum wallboard with joints taped on occupied side, and 1/2-inch fire-retardant plywood on construction side.
 2. Insulate partitions to provide noise protection to occupied areas.
 3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
 4. Protect air-handling equipment.
 5. Weatherstrip openings.
- F. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
 - a. Field Offices: Class A stored-pressure water-type extinguishers.
 - b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
 - c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
 2. Store combustible materials in containers in fire-safe locations.
 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
 4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
 5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
 6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 7. Provide hoses for fire protection of sufficient length to reach construction areas. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

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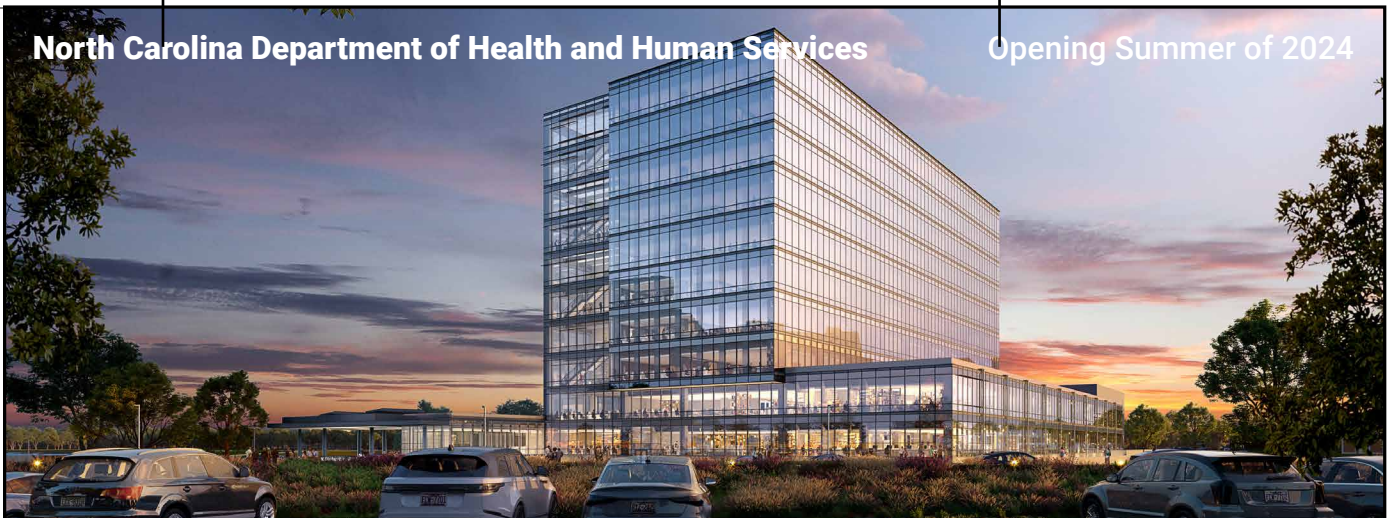
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North Carolina Department of Health and Human Services

Opening Summer of 2024



OWNER



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SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Individual Specification Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- C. Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.4 SUBMITTALS

- A. **Product List:** Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 2. **Form:** Tabulate information for each product under the following column headings:
 - a. Specification Section number and title.
 - b. Generic name used in the Contract Documents.
 - c. Proprietary name, model number, and similar designations.
 - d. Manufacturer's name and address.
 - e. Projected delivery date or time span of delivery period.
 - f. Identification of items that require early submittal approval for scheduled delivery date.
 3. **Completed List:** Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 4. **Architect's Action:** Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. **Substitution Requests:** Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. **Substitution Request Form:** Use form provided in this project manual.
 2. **Documentation:** Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction, where available for type of material proposed.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided

- within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
- j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Acceptance: Change Order.
 - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.
- C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
 - b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.
- D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
4. Store cementitious products and materials on elevated platforms.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.

D. Material Moisture and Mold Control: Comply with recommendations contained in Associated General Contractors (AGC) document "Managing the Risk of Mold in the Construction of Buildings." Prepare and submit plan for protecting materials from water damage, including the following:

1. Indicate delivery, checking and storage operations affected by water damage control efforts.
2. Indicate procedures for protecting porous materials from water damage, and how damaged materials will be handled.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet work has dried sufficiently to permit installation of related finish materials.
4. Describe protocol for dealing with large and unexpected water intrusion into completed portions of building. Indicate procedures for investigation of cause and effects, and methods for dealing with both.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. **Manufacturer's Warranty:** Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
7. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements.
2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements.
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
 6. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
 7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements.
1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
 2. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Requests for substitution following award of contract must comply with requirements of this article and are restricted to those necessitated by the following circumstances:
1. Specified product is no longer available for purchase.
 2. Specified product is not available within schedule requirements of project.
 3. Specified product is not compatible with other product approved for project.
 4. Specified warranty is not available.
- B. Timing: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
- C. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied and so certified by General Contractor. If the following conditions are

not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

2.3 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 016000

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SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner's portion of the Work.
 - 6. Coordination of Owner-installed products.
 - 7. Progress cleaning.
 - 8. Starting and adjusting.
 - 9. Protection of installed construction.
 - 10. Correction of the Work.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
 - 1. Prior to submitting cutting and patching plan, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Architect and Construction Manager of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
 - a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.
 - c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.
 - 2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.

- B. Certified Surveys: Submit two copies signed by land surveyor .
- C. Certificates: Submit certificate signed by land surveyor, certifying that location and elevation of improvements comply with requirements.
- D. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.5 CLOSEOUT SUBMITTALS

- A. Final Property Survey: Submit 5 copies showing the Work performed and record survey data.

1.6 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.

- i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

2.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

2.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.
- B. Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

2.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- D. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

2.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb, and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous

2.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

2.7 COORDINATION OF OWNER'S PORTION OF THE WORK

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

2.8 MOISTURE AND MOLD CONTROL

- A. General: Coordinate requirements in Contractor's approved Material and Mold Control Plan as described in Division 01 Section "Product Requirements." Avoid trapping water in finished work. Document visible signs of mold that may appear during construction. Comply with recommendations contained in Associated General Contractors (AGC) document "Managing the Risk of Mold in the Construction of Buildings," including the following:
- B. Exposed Phase of Construction:
 1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
 6. Use dunnage to create space between concrete decks and stored drywall.
- C. Partially Enclosed Phase of Construction:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Phase of Construction
 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Utilize permanent HVAC system to control humidity.

2.9 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

2.10 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, Comply with qualification requirements in Section 014000 "Quality Requirements."

2.11 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature, exposure to water, and relative humidity.
 - 1. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for forty-eight hours are considered defective.
 - 2. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record daily readings over a forty-eight hour period. Indicate materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - 3. Remove such materials that are not completely restored to their manufactured moisture level within forty-eight hours.

2.12 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 1. Recycling nonhazardous construction waste.
 2. Disposing of nonhazardous construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- C. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, construction waste becomes property of Contractor.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste. Include the following information:
 1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in tons.
 4. Quantity of waste salvaged, both estimated and actual in tons.
 5. Quantity of waste recycled, both estimated and actual in tons.
 6. Total quantity of waste recovered (salvaged plus recycled) in tons.

7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Qualification Data: For waste management coordinator.

1.7 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.
- B. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
 2. Review requirements for documenting quantities of each type of waste and its disposition.
 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Use Form CWM-1 for construction waste. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use Form CWM-3 for construction waste. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 3. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there were no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use Form CWM-5 for construction waste. Include the following:
1. Total quantity of waste.
 2. Estimated cost of disposal (cost per unit). Include transportation and tipping fees and cost of collection containers and handling for each type of waste.
 3. Total cost of disposal (with no waste management).
 4. Revenue from salvaged materials.
 5. Revenue from recycled materials.
 6. Savings in transportation and tipping fees by donating materials.
 7. Savings in transportation and tipping fees that are avoided.
 8. Handling and transportation costs. Include cost of collection containers for each type of waste.
 9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:
1. Construction Waste:
 - a. Masonry and CMU.
 - b. Lumber.
 - c. Wood sheet materials.
 - d. Wood trim.
 - e. Metals.
 - f. Roofing.
 - g. Insulation.
 - h. Carpet and pad.
 - i. Gypsum board.
 - j. Piping.

- k. Electrical conduit.
- l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Wood pallets.
 - 8) Plastic pails.
- m. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:
 - 1) Paper.
 - 2) Aluminum cans.
 - 3) Glass containers.

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
 - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.

- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.3 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
 - a. Comply with requirements in Section 329300 "Plants" for use of clean sawdust as organic mulch.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
 - 1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
 - a. Comply with requirements in Section 329300 "Plants" for use of clean ground gypsum board as inorganic soil amendment.
- D. Paint: Seal containers and store by type.

3.4 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.
- C. Burning: Do not burn waste materials.
- D. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning, including cleaning of HVAC system.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
 5. Submit testing, adjusting, and balancing records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 5. Advise Owner of changeover in utility services.
 6. Complete final cleaning requirements.
 7. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."

2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranties in Paper Form:
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

- k. Remove labels that are not permanent.
- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates. Remove paint or other matter obscuring labels.
- m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to unusual operating conditions.
- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
- r. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
- s. Clean strainers.
- t. Leave Project clean and ready for occupancy.

C. Final Cleaning Of HVAC System:

- 1. Comply with requirements of this paragraph if HVAC system was operated during construction, if HVAC system was left unprotected during construction, or if inspection of HVAC system indicates units are not in clean, like-new condition.
- 2. All HVAC system cleaning shall be in accordance with National Air Duct Cleaners Association (NADC) Standard 1992-01, Mechanical Cleaning of Non-Porous Air Conveyance Components, and the associated Guideline to the Standard.
- 3. Cleaning shall be accomplished by hand vacuuming and hand cleaning of all interior surfaces of the HVAC system to render the HVAC components visibly clean of dirt and debris and capable of passing NADCA Non-Porous Surfaces Cleaning Verification.
- 4. Any cleaned surface not being visibly clean or capable of passing the Vacuum Test as stipulated by the NADCA Standard 1992-01 shall be re-cleaned by the Contractor at no expense to the Owner.
- 5. Take air handlers (AHU) off-line during the cleaning process to minimize airborne migration of particulate matter within the ducts. Coordinate AHU shutdown with Owner.
 - a. Install clean polyester filter media pads in all supply diffusers prior to cleaning the system.
 - b. Provide access holes as required to perform thorough cleaning, and repair upon inspection and approval of cleaning.
 - c. All vacuuming shall be accomplished utilizing HEPA equipped vacuum cleaners. The equipment shall be so labeled or proof provided before commencement of the Work.
 - d. Where the particulate collection equipment is exhausting inside the building, use HEPA filtration with 99.97% collection efficiency for .03 micron size particles.
- 6. Supply Air System: Vacuum clean all interior surfaces and components in supply ductwork from the air handlers to all supply diffusers served by each air handler.
 - a. Vacuum clean all supply fan plenums.
 - b. Vacuum clean all coil plenums.
 - c. Wire brush and vacuum clean interior of fan housings and fan blades.
 - d. Wash supply fan bell inlets, fan blades, and fan interior surfaces using 500 to 1,000 p.s.i. moderate pressure wash with approved disinfectant.

- e. Clean all turning vanes at both upstream and downstream sides.
- f. Vacuum clean all interior components of all VAV mixing boxes.
- g. Remove all supply air diffusers, vacuum, wash clean and re-install.
- h. Vacuum and wash clean all filter holding frames and install new filters.
7. Return Air System: Vacuum clean all interior surfaces and components in return air ductwork from individual return grilles to the air handlers.
 - a. Vacuum clean all fresh air intake louvers, dampers, and return air/fresh air intake plenums.
 - b. Clean all turning vanes at both upstream and downstream sides.
 - c. Remove all return air grilles and wash clean and re-install.
8. Clean and disinfect all condensate trays and insure that drain lines are free-flowing.
9. Dispose of all debris removed from the HVAC system.

D. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

E. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations required by Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Initial Manual Submittal: Submit draft copy of each manual at least 15 days before commencing demonstration and training. Include a complete operation and maintenance directory. Architect will comment on whether general scope and content of manual are acceptable.
- B. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- C. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

1.6 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.7 MANUALS, GENERAL

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Architect.
 7. Cross-reference to related systems in other operation and maintenance manuals.

- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.8 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Organization: Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- C. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- D. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- E. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.9 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.

6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

1.10 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.

- D. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping.
 - 6. Normal shutdown instructions.
 - 7. Seasonal and weekend operating instructions.
 - 8. Required sequences for electric or electronic systems.
 - 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.11 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.

3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of maintenance manuals.
 2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."
 - 3.
- 1.12 PRODUCT MAINTENANCE MANUALS
- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and

telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

- D. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 017823

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SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.

1.3 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.4 INSTRUCTION PROGRAM

- A. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.

-
- f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.5 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.6 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 017900

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SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 01 Specification Sections and Appendix A: Asbestos Abatement Specific Requirement, and Asbestos Hard Abatement Plan and Air Monitoring Plan for Flooring and Flooring Mastic, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- D. Predemolition Photographs or Video: Submit before Work begins.
- E. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: See Appendix A for Asbestos Removal. It is not expected that other hazardous materials will be encountered in the Work.
 - 1. If other hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- 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 an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."

3.3 PREPARATION

- A. 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. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 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 fire watch and portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain adequate ventilation when using cutting torches.
 - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly.

- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

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SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel framing and supports for mechanical and electrical equipment.
 - 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
- B. Products furnished, but not installed, under this Section include the following:
 - 1. Loose steel lintels.
 - 2. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Fasteners.
 - 2. Paint products.
 - 3. Slotted channel framing.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
 - 1. Steel framing and supports for mechanical and electrical equipment.
 - 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 3. Shelf angles.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the jurisdiction in which Project is located.
- B. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Research Reports: For post-installed anchors.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Stainless Steel Bars and Shapes: ASTM A276/A276M, [**Type 304**] [**Type 316L**].
- D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- E. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: As indicated.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- E. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
- F. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
1. Fabricate units from slotted channel framing where indicated.
 2. Furnish inserts for units installed after concrete is placed.

2.7 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.8 STEEL AND IRON FINISHES

- A. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
1. Shop prime with universal shop primer unless zinc-rich primer is indicated.
- B. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
1. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 2. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 3. Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."

4. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."
- C. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
1. Cast Aluminum: Heavy coat of bituminous paint.
 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF 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

3.3 REPAIRS

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099123 "Interior Painting."

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055000

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wood blocking,, and nailers.
 - 2. Plywood backing panels.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- B. 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: The Southern Pine Inspection Bureau.
 - 4. WCLIB: West Coast Lumber Inspection Bureau.
 - 5. WWPA: Western Wood Products Association.
- C. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
 - 1. Preservative-treated wood.

1.4 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 and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

- B. Deliver interior wood materials that are to be exposed to view only after building is enclosed and weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 3. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWWA U1.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants or otherwise adversely affect finishes.
 3. Use Categories:
 - a. AWWA U1-UC2: Interior, potentially damp applications, such as beams, timbers, flooring, framing, millwork, sill plates.
 - b. AWWA U1-UC3B: Exterior, non-coated not in contact with ground, such as decking, sills, walkways, piers, railings/pickets.
 - c. AWWA U1-UC4A: Exterior, in contact with ground normal, such as fence/deck posts.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
1. Wood nailers, blocking, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood blocking, sleepers, and similar concealed members in contact with masonry or concrete.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and any 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. Eastern softwoods, No. 2 Common grade; NELMA.
- D. For blocking not used for attachment of other construction Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.4 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.
 - 1. Provide intumescent paint on all 6 sides.
 - 2. Use Interior Type A, unless otherwise indicated.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 316 stainless steel.
 - 2. Roof wood nailers shall be secured complying with FM Global Property Loss Prevention Data Sheet 1-49, 2.2.2 Wood Nailers.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1.

- G. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Do not splice structural members between supports, unless otherwise indicated.
- C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- E. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- G. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
 - 1. Do not use wood blocking in fire-resistance-rated assemblies.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

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SECTION 070150 – ROOF PATCHING AND REPAIR

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Repair of roofing necessitated by new penetrations for mechanical equipment.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.
- B. Reroofing Conference: Conduct conference at Project site.

1.6 FIELD CONDITIONS

- A. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- C. Limit construction loads on roof. Do not stack material in excess of structural capacity.
- D. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

PART 2 - PRODUCTS

2.1 INFILL AND REPLACEMENT MATERIALS

- A. Use infill materials matching existing roofing system materials unless otherwise indicated.

2.2 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Shut off rooftop utilities and service piping before beginning the Work.
- B. Protect existing roofing system that is not altered.
- C. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

3.2 ROOF TEAR-OFF

- A. Partial Roof Tear-Off: Where indicated, remove existing roofing and immediately check for presence of moisture by visually observing substrate that is to remain.
- B. Cut back existing roofing where required to accommodate new and enlarged penetrations as indicated.

3.3 BASE FLASHING REMOVAL

- A. Remove existing base flashings where indicated. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.

3.4 FLASHING AND REPAIRS

- A. Comply with manufacturer's recommendations and detail plates in *NRCA Roofing Manual: Membrane Roof Systems - 2011* for flashing new curbs into existing roofing and other work on roof, as indicated.
- B. Repair damaged areas, as indicated, with material matching existing.

- C. Perform all work to ensure existing warranty remains in force.

3.5 DISPOSAL

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150

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SECTION 078413 - PENETRATION FIRESTOPPING

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. Penetration firestopping systems for the following applications:
 - a. Penetrations in fire-resistance-rated walls.
 - b. Penetrations in horizontal assemblies.
 - c. Penetrations in smoke barriers.
- B. Related Requirements:
 - 1. Section 078443 "Joint Firestopping" for joints in or between fire-resistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Before installation of fire-resistance-rated assemblies and penetrating items, review penetration firestopping system and examine procedures for ensuring quality of installed systems. Require representatives of each entity directly concerned with penetration firestopping system to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for penetration firestopping system.
 - c. Penetration firestopping system manufacturer's field representative.
 - d. Penetration firestopping system Installer.
 - e. Fire-resistance-rated masonry Installer.
 - f. Fire-resistance-rated gypsum board assembly Installer.
 - g. Mechanical piping Installer.
 - h. HVAC ductwork Installer.
 - i. Electrical wireway Installer.
 - 2. Review inspection and testing and inspecting agency procedures for field quality control, penetration firestopping system installation, and coordination of penetrating item configurations with available rated penetration firestopping system assemblies.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:

- C. Shop Drawings: For each penetration firestopping system, show each kind of construction condition penetrated, relationships to adjoining construction, and kind of penetrating item. Include firestop design designation of testing and inspecting agency acceptable to authorities having jurisdiction that demonstrates compliance with requirements for each condition indicated.
1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each penetration firestopping system configuration for construction and penetrating item.
 2. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.
- D. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For firm 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. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.7 QUALITY ASSURANCE

- A. Installation Responsibility: Assign installation of penetration firestopping systems and joint firestopping systems in Project to a single qualified firestop subcontractor.
- B. Source Limitations: Obtain penetration firestopping and joint firestopping systems through one source from a single manufacturer.
- C. Installer Qualifications: A firm who is qualified by having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Firm shall hold current certification by third party attesting to its ability to select and install firestopping and employ trained supervisors to maintain oversight of firestopping installation.
1. Certification of Firestopping Firms: Firm shall have a minimum of ten (10) years experience in firestopping and comply with the following:
 - a. UL Qualified Firestop Contractor Program.
 2. Qualification for Superintendent: Superintendent shall have a minimum of 3 years experience in firestopping.

3. Qualification for Firestop Installer: Trained individual in accordance with requirements of certification of firm.
 - a. Firestop Installers Training (FIT) Level 1 by Specified Technologies, Inc.
 - b. Certified 3M Trained by 3M Fire Protection Products.
 - c. Hilti Basic Firestop Training
 - d. Similar training by manufacturers listed in Part 2.
4. A manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to an installer engaged by Contractor does not in itself confer qualification on buyer.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.
- C. Notify Owner's inspecting agency at least seven days in advance of penetration firestopping system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up penetration firestopping system installations that will become concealed behind other construction until Owner's inspecting agency and building inspector, if required by authorities having jurisdiction, have examined and approved each installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek Group in its "Directory of Listed Building Products."
 - 3) FM Approval in its "Approval Guide."

2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. Hilti North America.
 - c. Specified Technologies Inc.
 - d. Tremco Fire Protection Systems.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
1. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.
 2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
 3. W-Rating: Provide penetration firestopping systems showing no evidence of water leakage when tested according to UL 1479.
- D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479, based on testing at a positive pressure differential of 0.30-inch wg.
1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at and no more than 50-cfm cumulative total for any 100 sq. ft. at both ambient and elevated temperatures.
- E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
1. Permanent forming/damming/backing materials.
 2. Substrate primers.
 3. Collars.
 4. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Putty Pads: Release lined intumescent pad sized to fit single or double gang electrical boxes. Available products include the following:
 - 1. AcoustiGuard; Putty Pad.
 - 2. Acoustical Solutions; Firestop Putty Pad.
 - 3. Hilti; CFS-P PA.
 - 4. Kenetics Noise Control; IsoBacker.
 - 5. STI; SpecSeal Series SSP Putty Pad.
- G. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- H. 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.
- I. 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.
- J. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- K. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

2.4 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's name, address, and phone number.
 3. Designation of applicable testing and inspecting agency.
 4. Date of installation.
 5. Manufacturer's name.
 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413

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SECTION 078443 - JOINT FIRESTOPPING

TIPS:

To view non-printing Editor's Notes that provide guidance for editing, click on MasterWorks/Single-File Formatting/Toggle/Editor's Notes.

To read detailed research, technical information about products and materials, and coordination checklists, click on MasterWorks/Supporting Information.

Content Requests:

<Double click here to submit questions, comments, or suggested edits to this Section.>

Access Manufacturer-Provided, AIA MasterSpec-Based Sections:

<Double click here for this Section based on specific manufacturer's products set as Basis-of-Design at ProductMasterSpec.com.>

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. Joints in or between fire-resistance-rated constructions.
2. Joints at exterior curtain-wall/floor intersections.
3. Joints in smoke barriers.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers and for wall identification.
2. Section 079513.13 "Interior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for interior floors, walls, and ceilings.
3. Section 079513.16 "Exterior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for exterior building walls, soffits, and parapets.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each joint firestopping system, show relationships to adjoining construction. Include firestop design designation of testing and inspecting agency acceptable to authorities having jurisdiction that evidences compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each joint firestopping system configuration for construction and penetrating items.
 - 2. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.

1.5 INFORMATIONAL 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. Listed System Designs: For each joint firestopping system, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.7 QUALITY ASSURANCE

- A. Installation Responsibility: Assign installation of penetration firestopping systems and joint firestopping systems in Project to a single qualified firestop subcontractor.
- B. Source Limitations: Obtain penetration firestopping and joint firestopping systems through one source from a single manufacturer.
- C. Installer Qualifications: A firm who is qualified by having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Firm shall hold current certification by third party attesting to its ability to select and install firestopping and employ trained supervisors to maintain oversight of firestopping installation.
 - 1. Certification of Firestopping Firms: Firm shall have a minimum of ten (10) years experience in firestopping and comply with the following:
 - a. UL Qualified Firestop Contractor Program.

2. Qualification for Superintendent: Superintendent shall have a minimum of 3 years experience in firestopping.
3. Qualification for Firestop Installer: Trained individual in accordance with requirements of certification of firm.
 - a. Firestop Installers Training (FIT) Level 1 by Specified Technologies, Inc.
 - b. Certified 3M Trained by 3M Fire Protection Products.
 - c. Hilti Basic Firestop Training
 - d. Similar training by manufacturers listed in Part 2.
4. A manufacturer's willingness to sell its joint firestop system products to Contractor or to an installer engaged by Contractor does not in itself confer qualification on buyer.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.
- C. Notify Owner's inspecting agency at least seven days in advance of joint firestopping system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up joint firestopping system installations that will become concealed behind other construction until Owner's inspecting agency and building inspector, if required by authorities having jurisdiction, have examined each installation.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Joint firestopping systems shall bear classification marking of a qualified testing agency.

- 1) UL in its "Fire Resistance Directory."
- 2) Intertek Group in its "Directory of Listed Building Products."

- B. Rain/Water Resistance: For perimeter fire-barrier system applications, where inclement weather or greater-than-transient water exposure is expected, use products that dry rapidly and cure in the presence of atmospheric moisture sufficient to pass ASTM D6904 early rain-resistance test (24-hour exposure).

2.3 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. Hilti North America.
 - c. Specified Technologies Inc.
 - d. Tremco Fire Protection Systems
 2. Joint firestopping systems that are compatible with one another, with the substrates forming openings, and with penetrating items, if any.
 3. Provide products that, upon curing, do not re-emulsify, dissolve, leach, breakdown, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture.
 4. Provide firestop products that do not contain ethylene glycol.
- B. Intumescent Gypsum Wall Framing Gaskets (Applied to Steel Tracks, Runners and Studs prior to Framing Installation): Provide products with fire, smoke, and acoustical ratings that allow movement up to 100 percent compression and/or extension in accordance with UL 2079 or ASTM E1966; have an L Rating less than 1 cfm/ft. in accordance with UL 2079; and a minimum Sound Transmission Class (STC) rating of 56 in accordance with ASTM E90 or ASTM C919.
- C. For aluminum curtain-wall assemblies with one- or two-piece rectangular mullions at least 2-1/2 by 5 inches, provide perimeter fire-barrier system that does not require direct screw attachment to mullions and transoms to support and fasten curtain-wall insulation.
- D. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.
1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- E. Joints at Exterior Curtain-Wall/Floor Intersections: Provide joint firestopping systems with rating determined per ASTM E2307.
1. F-Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
- F. Joints in Smoke Barriers: Provide joint firestopping systems with ratings determined per UL 2079 based on testing at a positive pressure differential of 0.30-inch wg.
1. L-Rating: Not exceeding 5.0 cfm/ft. of joint at both ambient and elevated temperatures.

- G. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.
- H. Accessories: Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately 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 elastomeric fill materials or compromise fire-resistive rating.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Apply a suitable bond-breaker to prevent three-sided adhesion in applications where this condition occurs, such as the intersection of a gypsum wall to floor or roof assembly where the joint is backed by a steel ceiling runner or track.

3.3 INSTALLATION

- A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

- C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 ft. from end of wall and at intervals not exceeding 30 ft..
- B. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's name, address, and phone number.
 3. Designation of applicable testing agency.
 4. Date of installation.
 5. Manufacturer's name.
 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2393.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.
- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or

deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

END OF SECTION 078443

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SECTION 079200 - JOINT SEALANTS

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. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Mildew-resistant joint sealants.
 - 4. Butyl joint sealants.
 - 5. Latex joint sealants.
 - 6. Acoustical joint sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.
- C. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.

- D. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- E. Field-Adhesion-Test Reports: For each sealant application tested.
- F. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 - 3. Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with masonry substrates.
 - 4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 - 5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 - 7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each kind of sealant and joint substrate.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

- a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.7 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period, silicone sealants: 20 years from date of Substantial Completion.
 2. Warranty Period, all other types: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS**2.1 JOINT SEALANTS, GENERAL**

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
 - 1. Where color is indicated to ““match adjacent substrates”” provide either manufacturer’s standard color if matching color is available, or, if not available, provide field tintable custom color.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Single Component Nonsag Neutral-Curing Silicone Sealant ES-1:
 - 1. Products:
 - a. Dow Corning Corporation; 756.
 - b. Pecora Corporation; 890FTS or 890NST.
 - c. Sikasil WS-290
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 100.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - 6. Non-staining for natural stone substrates.
 - 7. Field-tintable to match adjacent substrates.
- D. Single-Component Neutral-Curing Silicone Sealant ES-2:
 - 1. Products:
 - a. Dow Corning Corporation; 790.
 - b. Pecora Corporation; 864.
 - c. Tremco; Spectrem 2.
 - d. Sikasil WS-290
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 50.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
- E. Single-Component Traffic Exposure Neutral-Curing Silicone Sealant ES-3:
 - 1. Products:
 - a. Dow Corning Corporation; 890-SL.

- b. Dow Corning Corporation; 890 (Gun grade).
- c. Dow Corning Corporation; 890-SL.
- d. Pecora Corporation; 300 Pavement Sealant (Self Leveling).
- e. Pecora Corporation; 301 Pavement Sealant (Gun grade).
- f. Sikaflex
2. Type and Grade: S (single component) and P (pourable).
3. Class: 100/50.
4. Uses Related to Exposure: NT and T (traffic).
5. Uses Related to Joint Substrates: M A and O, as applicable to joint substrates indicated.

2.3 EPOXY RESIN GEL JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 881 and the following:
1. Pick-Proof Sealant: Two-component, solvent-free, moisture insensitive, low modulus, non-sagging epoxy resin gel, XS-1.
 - 1) Degussa Corporation; Concrevisive Liguid LPL
 - 2) Sika Corporation; Sikadur 23, Lo-Mod Gel
 - 3) Tamms Industries; Duralcrete Gel
- B. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant ES-4:
1. Products:
 - a. Dow Corning Corporation; 786.
 - b. Pecora Corporation; 898.
 - c. Tremco; Tremsil 600 White.
 2. Type and Grade: S (single component) and NS (nonsag).
 3. Class: 25.
 4. Use Related to Exposure: NT (nontraffic).
 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
- C. Single-Component Nonsag Urethane Sealant ES-5:
1. Products:
 - a. BASF; MasterSEal CR 195.
 - b. Pecora Corporation; Dynatrol I-XL.
 - c. Sika Corporation, Inc.; Sikaflex 15LMg
 - d. Tremco; DyMonic.
 - e. Tremco; Vulkem 921.
 2. Type and Grade: S (single component) and NS (nonsag).
 3. Class: 25.
 4. Use Related to Exposure: NT (nontraffic).
 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 6. Paintable.

2.4 LATEX JOINT SEALANTS

- A. Latex Sealant LS-1: Comply with ASTM C 834, Type P, Grade NF.
1. Products:
 - a. Pecora Corporation; AC-20+.
 - b. Sonneborn, Division of ChemRex Inc.; Sonolac.
 - c. Tremco; Tremflex 834.

2.5 BUTYL RUBBER JOINT SEALANTS

- A. Butyl Rubber Sealant JS-6: Comply with ASTM C1311.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Bostik, Inc; Chem-Calk 300.
 - b. Tremco, Inc., Tremco Butyl Sealant.

2.6 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 1. Products:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
- B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.
 - 1. Products:
 - a. Pecora Corporation; BA-98.
 - b. Tremco; Tremco Acoustical Sealant.
- C. Acoustical Fire Rated Outlet Backer Pad:
 - 1. Basis of Design: IsoBacker from Kinetics Noise Control.

2.7 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) or as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), or B (bicellular material with a surface skin), as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- D. For curtain wall applications, Type O (open-cell material) may be considered; consult the sealant manufacturer to confirm the specific backer material to be used for the specific project and application, and submit to Architect the manufacturer's written recommendations.]

- E. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
- F. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.8 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.

- c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- #### A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 090190.52 - MAINTENANCE REPAINTING

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 maintenance repainting as follows:
 - 1. Patching substrates.
 - 2. Repainting.
- B. Related Requirements

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 QUALITY ASSURANCE

- A. Mockups: Prepare mockups of maintenance repainting processes for each type of coating system and substrate indicated and each color and finish required to demonstrate aesthetic effects and to set quality standards for materials and execution. Duplicate appearance of approved Sample submittals.
 - 1. Locate mockups on existing surfaces where directed by Architect.
 - 2. Surface-Preparation Mockups: On existing surfaces using applicable specified methods of cleaning and other surface preparation.
 - 3. Coating Mockups: To represent surfaces and conditions for application of each type of coating system under same conditions as the completed Work.
 - 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste daily.

PART 2 - PRODUCTS

2.1 PREPARATORY CLEANING MATERIALS

- A. Water: Potable.
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F.
- C. Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 1/2 cup of laundry detergent that contains no ammonia, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for every 5 gal. of solution required.
- D. Mildewcide: Commercial proprietary mildewcide or a job-mixed solution prepared by mixing 1/3 cup of household detergent that contains no ammonia, 1 quart of 5 percent sodium hypochlorite bleach, and 3 quarts of warm water.
- E. Abrasives for Ferrous Metal Cleaning: Aluminum oxide paper, emery paper, fine steel wool, steel scrapers, and steel-wire brushes of various sizes.
- F. Rust Remover: Manufacturer's standard phosphoric acid-based gel formulation, also called "naval jelly," for removing corrosion from iron and steel.

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. Colors: As indicated on Interior Finish Legend on Drawings.

2.3 PAINT MATERIALS

- A. Paint: Refer to Section 099123 "Interior Painting" for products relating to this Section.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical solutions from coming into contact with people and surfaces that could be harmed by such contact.
 1. Cover adjacent surfaces with materials that are proven to resist chemical solutions being used unless the solutions will not damage adjacent surfaces. Use protective materials that

are UV resistant and waterproof. 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. Do not apply chemical solutions during winds of sufficient force to spread them to unprotected surfaces.
3. Neutralize and collect alkaline and acid wastes before disposal.
4. Dispose of runoff from 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 MAINTENANCE REPAINTING, GENERAL

- A. Maintenance Repainting Appearance Standard: Completed work is to have a uniform appearance as viewed by Architect from building interior at 5 feet away from painted surface.
- B. Execution of the Work: In repainting surfaces, disturb them as minimally as possible and as follows:
 1. Remove failed coatings and corrosion and repaint.
 2. Verify that substrate surface conditions are suitable for repainting.
 3. Allow other trades to repair items in place before repainting.
 4. Perform all necessary surface preparation to provide an even, smooth surface for painting. Contractor to determine existing paint type and take necessary steps to prepare wall so new paint will not peel.
- C. Mechanical Abrasion: Where mechanical abrasion is needed for the work, use gentle methods, such as scraping and lightly hand sanding, that will not abrade softer substrates, reducing clarity of detail.
- D. Heat Processes: Do not use torches, heat guns, or heat plates.

3.3 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of painting work. Comply with paint manufacturer's written instructions for inspection.
- B. Maximum Moisture Content of Substrates: Do not begin application of coatings unless moisture content of exposed surface is below the maximum value recommended in writing by paint manufacturer and not greater than the following maximum values when measured with an electronic moisture meter appropriate to the substrate material:
 1. Gypsum Board: 12 percent.
 2. Wood: 15 percent.
- C. Alkalinity: Do not begin application of coatings unless surface alkalinity is within range recommended in writing by paint manufacturer.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
 1. If existing surfaces cannot be prepared to an acceptable condition for proper finishing by using specified surface-preparation methods, notify Architect in writing.

- E. 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.

3.4 PREPARATORY CLEANING

- A. General: Use the gentlest, appropriate method necessary to clean surfaces in preparation for painting. Clean all surfaces, corners, contours, and interstices.
- B. Detergent Cleaning: Wash surfaces by hand using clean rags, sponges, and bristle brushes. Scrub surface with detergent solution and bristle brush until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet. Rinse with water applied by clean rags or sponges.
- C. Mildew: Clean off existing mildew, algae, moss, plant material, loose paint, grease, dirt, and other debris by scrubbing with bristle brush or sponge and detergent solution. Scrub mildewed areas with mildewcide. Rinse with water applied by clean rags or sponges.

3.5 SUBSTRATE REPAIR

- A. General: Repair substrate surface defects that are inconsistent with the surface appearance of adjacent materials and finishes.
- B. Wood Substrate:
 - 1. Repair wood defects including dents and gouges more than 1/4 inch in size and all holes and cracks by filling with wood-patching compound and sanding smooth. Reset or remove protruding fasteners.
 - 2. Where existing paint is allowed to remain, sand irregular buildup of paint, runs, and sags to achieve a uniformly smooth surface.
- C. Gypsum-Board Substrates:
 - 1. Repair defects including dents and chips more than 1/4 inch in size and all holes and cracks by filling with gypsum patching compound and sanding smooth. Remove protruding fasteners.
 - 2. Rout out surface cracks to remove loose, unsound material; fill with patching compound and sand smooth.
- D. Metal Substrate:
 - 1. Preparation: Treat repair locations by wire-brushing.
 - 2. Priming: Prime iron and steel surfaces immediately after repair to prevent flash rusting. Stripe paint corners, crevices, bolts, welds, and sharp edges. Apply two coats to surfaces that are inaccessible after completion of the Work.

3.6 PAINT APPLICATION, GENERAL

- A. Comply with manufacturers' written instructions for application methods unless otherwise indicated in this Section.

- B. Apply a transition coat over incompatible existing coatings.
- C. Metal Substrate: Stripe paint corners, crevices, bolts, welds, and sharp edges before applying full coat. Apply two coats to surfaces that are inaccessible after completion of the Work. Tint stripe coat different than the main coating and apply with brush.
- D. Blending Painted Surfaces: When painting new substrates patched into existing surfaces or touching up missing or damaged finishes, apply coating system specified for the specific substrate. Apply final finish coat over entire surface from edge to edge and corner to corner.

3.7 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.

END OF SECTION 090190.52

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SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
- B. Related Requirements:
 - 1. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.
- D. Samples for Initial Selection: For each type of trim accessory indicated.
- E. Samples for Verification: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.

1.3 MOCKUPS

- A. Build mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Build mockups for the following:
 - a. Each level of gypsum board finish indicated for use in exposed locations.
 - b. Each texture finish indicated.
 - 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
 - 3. Simulate finished lighting conditions for review of mockups.
 - 4. 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 C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.3 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.

2.4 INTERIOR GYPSUM BOARD

- A. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated, or comparable products by one of the following:
 - 1. USG Corporation (Basis-of-Design)
 - 2. American Gypsum.
 - 3. CertainTeed Corporation.
 - 4. Georgia-Pacific Gypsum LLC.
 - 5. National Gypsum Company.
- B. Gypsum Wallboard: ASTM C1396/C1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

- C. Gypsum Board, Type X: ASTM C1396/C1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
- D. Gypsum Ceiling Board: ASTM C1396/C1396M.
 - 1. Thickness: 1/2 inch.
 - 2. Long Edges: Tapered.
- E. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Core: 5/8 inch, Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.5 SPECIALTY GYPSUM BOARD

- A. Gypsum Board, Type C: ASTM C1396/C1396M. Manufactured to have increased fire-resistive capability.
 - 1. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
 - 2. Long Edges: Tapered.

2.6 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
 - 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. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. 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 Corportaion.
 - b. Gordon, Inc.
 - c. Pittcon Industries.
 - 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.
 - 3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.7 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.

- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

- 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, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

2.8 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

- D. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

- E. Acoustical 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 support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Comply with ASTM C840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. 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 C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Wallboard Type: As indicated on Drawings.
 - 2. Type X: As indicated on Drawings.

3. Ceiling Type: As indicated on Drawings.
4. Abuse-Resistant Type: As indicated on Drawings.
5. Mold-Resistant Type: As indicated on Drawings.
6. Type C: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

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 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. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers according to manufacturer's written instructions.

D. 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 instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLATION OF EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS

- A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
1. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
 2. Fasten with corrosion-resistant screws.

3.5 INSTALLATION OF 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 at locations indicated on Drawings.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners unless otherwise indicated.
 - 2. Bullnose Bead: Use where indicated on Drawings.
 - 3. LC-Bead: Use at exposed panel edges.
 - 4. L-Bead: Use where indicated on Drawings.
 - 5. U-Bead: Use where indicated on Drawings.
 - 6. Curved-Edge Cornerbead: Use at curved openings.
- D. Exterior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use at exposed panel edges.
- E. Aluminum Trim: Install in locations indicated on Drawings.

3.6 FINISHING OF 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 C840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Where indicated on Drawings.
 - 3. Level 3: Where indicated on Drawings.
 - 4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
 - 5. Level 5: Where indicated on Drawings.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.7 APPLICATION OF TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written instructions.

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 095113 - ACOUSTICAL PANEL CEILINGS

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 DEFINITIONS

- A. AC: Articulation Class.
- B. CAC: Ceiling Attenuation Class.
- C. LR: Light Reflectance coefficient.
- D. NRC: Noise Reduction Coefficient.

1.3 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceilings.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For ceiling systems and sealants, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.
- C. Samples for Initial Selection: For components with factory-applied color finishes.
- D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of full-size Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch- long Samples of each type, finish, and color.

1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Suspended ceiling components.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Size and location of initial access modules for acoustical panels.
 - 4. Items penetrating finished ceiling including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
 - 5. Perimeter moldings.
- B. Qualification Data: For testing agency.
- C. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.
- E. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to NVLAP for testing indicated.
- B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup of typical ceiling area as shown on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.
- D. 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. 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.
- E. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
 1. CISCA's Guidelines for Systems Requiring Seismic Restraint: Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies-- Seismic Zones 3 & 4."

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.10 FIELD 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements provide Basis of Design products to match existing acoustical ceiling panels; or provide comparable, Architect approved products by one of the following:
 1. Armstrong World Industries, Inc.
 2. USG Interiors.
 3. Chicago Metallic.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 450 or less.

2.3 ACOUSTICAL PANELS, GENERAL

- A. Low-Emitting Materials: Acoustical panel ceilings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Source Limitations:
 1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
 2. Suspension System: Obtain each type from single source from single manufacturer.
- C. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.
- D. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- E. 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 NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.
- F. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.
- G. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
 1. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.
- B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.
- D. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.
- E. Impact Clips: Provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.
- F. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.
- G. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

2.5 METAL SUSPENSION SYSTEM

- A. Suspension System: Provide Wide-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, not less than G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.
 - 1. Products: Provide one of the following unless indicated differently:
 - a. Armstrong Prelude grid.
 - b. USG Interiors; Donn DX grid.
 - 2. Structural Classification: Heavy-duty system.
 - 3. End Condition of Cross Runners: Override (stepped) or butt-edge type.
 - 4. Face Design: Flat, flush.
 - 5. Cap Material: aluminum cold-rolled sheet.
 - 6. Cap Finish:
 - a. Painted white.

2.6 METAL EDGE MOLDINGS AND TRIM

- 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer of ceiling grid.
- B. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following:
 - 1. Aluminum Alloy: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221 for Alloy and Temper 6063-T5.

2. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils. Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
3. Wall Angle: 2-inch wide, approved for use in seismic areas.
 - a. Armstrong; #7808.
 - b. USG; M20SM.
4. Color: factory painted to match ceiling grid.
5. For sprinkler heads and other penetrations, provide 2-inch oversized ring or sleeve through the ceiling to allow for free movement of at least 1 inch in all horizontal directions.

2.7 ACOUSTICAL SEALANT

- A. Products: Subject to compliance with requirements, provide one of the following:
 1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. USG Corporation; SHEETROCK Acoustical Sealant.
 2. Acoustical Sealant for Concealed Joints:
 - a. Henkel Corporation; OSI Pro-Series SC-175 Acoustical Sound Sealant.
 - b. Pecora Corporation; AIS-919.
 - c. Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 1. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.
 2. Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant.
 3. Acoustical sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
1. 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.
 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 7. Do not attach hangers to steel deck tabs.
 8. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 9. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
- G. Install impact clips in areas indicated, and in areas required by authorities having jurisdiction; space as recommended by panel manufacturer's written instructions unless otherwise indicated.
- H. Comply with manufacturer's written instructions for the installation of suspended ceiling canopies. Use accessories and components recommended by or supplied by the canopy manufacturer.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 1. Compliance of seismic design.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.
- C. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations show compliance with requirements.
 1. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed.
 - a. Within each test area, testing agency will select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf of tension.
 - b. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.
- D. Acoustical panel ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.5 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

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SECTION 099123 - INTERIOR PAINTING

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. Primers.
 - 2. Water-based finish coatings.
 - 3. Floor sealers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product Schedule: Use same designations indicated on Drawings and in the Interior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint Products: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups 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.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.

- a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F 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 Paints.
 3. Sherwin-Williams Company (The).
 4. Rose Talbert Paint Company.
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated found at the end of Part 3.
- C. Source Limitations: Obtain each paint product from single source from single manufacturer.

2.2 PAINT PRODUCTS, GENERAL (PNT-1, PNT02, PNT-3, PNT-4, PNT-5, PNT-6)

- A. Material Compatibility:
 1. Materials for use within each paint system shall be 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, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

- B. Colors: As indicated on Interior Finish Legend on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 WALL IDENTIFICATION

- A. Permanently label fire barriers, fire partitions, fire walls, smoke barriers, and smoke partitions with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
 - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 20 feet.
 - 2. Apply a minimum one-inch-wide bright red horizontal line, both sides of wall, interrupted for approved text, at the required interval.

3.4 INSTALLATION

- 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.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. 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.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. 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.
- E. Back-Rolling: Back roll all spray applications on walls and ceilings to allow for touch up.
- F. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:
 - a. Hot- and cold-water piping; fire-suppression piping.
 - 2. Paint the following work where exposed in occupied spaces:
 - a. Hot- and cold-water piping; fire-suppression piping.

3.5 WALL IDENTIFICATION

- A. Permanently label fire barriers, fire partitions, fire walls, smoke barriers, and smoke partitions with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
 - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 20 feet.
 - 2. Apply a minimum one-inch-wide bright red horizontal line, both sides of wall, interrupted for approved text, at the required interval.

3.6 FIELD QUALITY CONTROL

- A. Dry-Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry-film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry-film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry-film thickness that complies with paint manufacturer's written recommendations.

3.7 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 - 3. Allow empty paint cans to dry before disposal.
 - 4. Collect waste paint by type and deliver to recycling or collection facility.
- 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.

3.8 INTERIOR PAINTING SCHEDULE

- A. Steel Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Water-based rust-inhibitive primer.
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Ultra Spec HP Acrylic Metal Primer, HP04.

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- b) PPG Paints; Pitt-Tech Int/Ext DTM Industrial Primer, 90-712.
 - c) Sherwin-Williams; Pro Industrial Pro-Cryl Universal Primer, B66W01310.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5).
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Ultra Spec Interior Gloss Finish, N540.
 - b) PPG Paints; Speedhide Zero Interior Zero-VOC Latex Semi Gloss, 6-4510XI.
 - c) Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series.
- B. Galvanized-Metal Substrates:
- 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Water-based galvanized primer.
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Ultra Spec HP Acrylic Metal Primer, HP04.
 - b) PPG Paints; Pitt-Tech Plus 4020 PF, 4020.
 - c) Sherwin-Williams; Pro Industrial Pro-Cryl Universal Primer, B66W1310 Series.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, institutional low odor/VOC, semigloss.
 - d. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5).
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Ultra Spec Interior Gloss Finish, N540.
 - b) PPG Paints; Speedhide Zero Interior Zero-VOC Latex Semi Gloss, 6-4510XI.
 - c) Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series.
- C. Wood Substrates: Wood trim. Opaque finish, not transparent stain.
- D. Gypsum Board Substrates:
- 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Interior, institutional low-odor/VOC primer sealer.
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Ultra Spec 500 Zero VOC Primer, N534.
 - b) PPG Paints; Speedhide Interior Latex Sealer Quick Drying, 6-2.
 - c) Sherwin-Williams; ProMar 200 Latex Primer, B28W02600.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1).
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Ultra Spec 500 Interior Flat Finish, N536.
 - b) PPG Paints; Speedhide Zero Interior Zero-VOC Flat, 6-4110XI.

-
- c) Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series.
 - d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell (MPI Gloss Level 3).
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Ultra Spec 500 Interior Eggshell, N538.
 - b) PPG Paints; Speedhide Zero Interior Zero-VOC Eggshell, 6-4310XI.
 - c) Sherwin-Williams; ProMar 200 Zero VOC Interior Eg-Shel Latex, B20-2600 Series.
 - 2. (Epoxy System) Water-Based Light-Industrial Coating System:
 - a. Prime Coat: Interior latex primer sealer.
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Eco Spec WB Interior Latex Primer, N372.
 - b) PPG Paints; Speedhide Interior Latex Sealer Quick Drying, 6-2.
 - c) Sherwin-Williams; ProMar 200 Latex Primer, B25W2600.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat; Interior Pre-Catalyzed Epoxy, eggshell, (Gloss Level 3):
 - 1) Products: Subject to compliance with requirements, provide one of the following:
 - a) Benjamin Moore; Corotech Pre Catalyzed Waterborne Epoxy Eggshell, V342.
 - b) PPG Paints; Pitt-Glaze WB1 Interior Eggshell Pre-Catalyzed Waterborne Epoxy, 16-310 Series.
 - c) Sherwin-Williams; Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45-150 Series.

END OF SECTION 099123

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SECTION 220310 – PLUMBING PIPE, TUBE AND FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

A. Industry Standards:

1. Qualify welding procedures, welders, and operators in accordance with ASME B31.1 for shop and project site welding of piping work.
2. Certify welding of piping work using the standard procedure specifications by, and welders tested under supervision of, the National Certified Pipe Welding Bureau.
3. Where plastic piping is indicated to transport potable water, provide pipe and fittings bearing approval label by the National Sanitation Foundation (NSF).
4. Press joint fittings shall be installed using the proper tool, actuator, jaws, and rings as instructed by the press fitting manufacturer. Installing contractor shall be familiar with the installation of press joint systems and qualified through training provided directly by the fitting manufacturer.

B. Submittals:

1. Submit manufacturer's data, welding certifications, press to connect fitting training certifications, test reports, and product warranties as applicable for all piping materials.
2. Grooved joint couplings and fittings and press joint fittings shall be shown on drawings and product submittals and be specifically identified with the applicable style number.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS:

- A. General: Provide pipe and tube of the type, joint type, grade, size, and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by Installer for installation requirements and comply with governing regulations and industry standards.
- B. Black Steel Pipe: ASTM A 53, Schedule 40, [Schedule 10], [Schedule 5].

2.2 PIPE/TUBE FITTINGS:

- A. General: Provide factory-fabricated fittings of the type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube

valve or equipment connections in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.

- B. Cast-Iron Threaded Fittings for Steel Pipe: ASTM A 126-84 Class 125, plain or galvanized to match pipe.
- C. Welded Fittings for Steel Pipe: ASTM A234.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Install pipe, tube, and fittings in accordance with recognized industry practices which will achieve permanently-leakproof piping systems, capable of performing each indicated service without piping failure. Install each run with a minimum of joints and couplings, but with adequate and accessible unions for disassembly and maintenance/ replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance.
 - 1. Comply with ASME B31.1 Code for Pressure Piping.
 - 2. Comply with ASME B31.9 Code for Building Services Piping.
- B. Locate piping runs as indicated on the drawings. Route vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown, or described by diagrams, details, and notations or, if not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building and its equipment. Where possible, locate insulated piping for 1" clearance outside insulation. Changes in direction shall be made with fittings.
- C. Piping System Joints: Provide joints of the type indicated in each piping system.
- D. Threaded Joints: Thread pipe in accordance with ANSI B2.12; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed.
- E. Welded Joints: Weld pipe joints in accordance with recognized industry practice and as follows: Weld pipe joints only when ambient temperature is above 0 F. where possible. Bevel pipe ends at a 37.5-degree angle where possible, smooth rough cuts and clean to remove slag, metal particles and dirt. Install welding rings for butt welded joints. Use pipe clamps or tack-weld joints with 1" long welds; (4) welds for pipe sizes to 10". Build up welds with a stringer-bead pass, followed by a hot pass, followed by a cover or filler pass. Eliminate valleys at center and edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow holes and non-metallic inclusions. Do not weld-out piping system imperfections by tack-welding procedures; refabricate to comply with requirements. Install forged branch-connection fittings wherever branch pipe is indicated or install regular "T" fitting (at Contractor's option).

3.2 CLEANING, FLUSHING, AND INSPECTING:

- A. General: Clean exterior surfaces of installed piping systems of superfluous materials and prepare for application of specified coatings.
- B. Flush out piping system with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

3.3 PIPING TESTS:

- A. General: Provide temporary equipment for testing, including pump and gages. Test piping systems before insulation is installed wherever feasible and remove control devices before testing. Test each natural section of each piping system independently, but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Required test period is (2) hours.
- B. Unless otherwise specified for specific systems, hydraulically test each pressurized piping system at 150% of operating pressure indicated, but not less than 100-psig test pressure.
- C. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 5% of test pressure.
- D. Repair piping systems sections which fail the required piping test, by disassembly and re-installation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compound, mastics, or other temporary repair methods. Drain test water from piping systems after repair work and retesting has been completed.

END OF SECTION 220310

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SECTION 220320 – PLUMBING HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties on all items.

PART 2 - PRODUCTS

2.1 HANGERS AND SUPPORTS:

- A. General: Except as otherwise indicated, provide factory-fabricated piping hangers and supports of the type specified complete with bolts and washers. Comply with the manufacturer's published product information. Size hangers and supports properly for piping and weight of the medium being transported. Provide insulation shields for all insulated piping.
- B. Piping installed above a roof shall be supported on prefabricated, non-penetrating supports by Pipe Pier, B-Line or Cooper. Provide matching adjustable elevation kits and method for positive attachment to roof.

PART 3 - EXECUTION

3.1 HORIZONTAL PIPING SUPPORT:

- A. Maximum spacing of hangers and supports for above-ground horizontal pipe and tubing shall be in accordance with the applicable International Plumbing Code.
- B. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated, or by other recognized industry methods.
- C. Branch piping located in walls, partitions or pipe chases shall be rigidly supported inside the wall or chase.
- D. Piping installed above a roof shall be supported on prefabricated, non-penetrating supports by Pipe Pier or approved equal. Provide matching adjustable elevation kits.

3.2 VERTICAL PIPING SUPPORT:

- A. Maximum spacing of vertical supports for pipe and tubing shall be in accordance with the applicable International Plumbing Code.
- B. Fixture Supports: See Fixture Schedule. Provide concealed supports and carriers recommended by the manufacturer of the fixtures and equipment to suit the structural and finish conditions.

3.3 ADJUSTMENT OF HANGERS AND SUPPORTS:

- A. Adjust hangers and supports to bring piping to proper level, elevations, and slopes.

END OF SECTION 220320

SECTION 221410 - GAS PIPING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties as applicable for all items.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS:

- A. General: Comply with the Section 220310 for product requirements of piping materials. For each service, provide the piping materials indicated including pipe, tube, fittings, hangers, supports, anchors, valves, and accessories. Where more than one type is indicated, selection is Installer's option.
- B. Above Ground: Schedule 40 black steel pipe of the size indicated with Class 150 malleable iron threaded fittings.
- C. Below Ground: Plastic pipe and fittings conforming to ASTM D2513, Grade 2406.
- A. Below Slab: 2" and Smaller - Corrugated Stainless Steel Tubing (CSST)
 - 1. Codes: ICC Codes (IFGC, IRC, IMC, IPC), NFPA 54, UPC, CAN/CSA B149.1, NFPA58.
 - 2. Standards: ANSI LC1/CSA 6.26, UL723 (ASTM E84), ICC LC 1024, ANSIZ223.
 - 3. Listings: CSA, ICC PMG1058, UL (Through Penetration Firestop System), FM, IAPMO ES ER-0227.
 - 4. Pipe: Tubing shall be 300 series Stainless Steel Strip conforming to ASTM A240 rated for 5 psi and 25 psi and have an elevated pressure rating of 125G for sizes up to 1 ¼" and 25G for 1 ½" and 2". Tubing shall not be subjected to heat treating or annealing after the corrugation forming operation.
 - 5. Conductive Jacket: Jacket shall be an extruded fire- retarded engineered polymer designed to enhance the energy dissipating properties of the flexible gas piping. Conductive jacket shall conform to ASTM E-84 flame spread rating not to exceed 25 and ASTM-E84 smoke density rating shall not exceed 50, and shall be resistant to UV.
 - 6. Fittings-shall be made of yellow brass and be tested and listed with CSA International for concealed use. Joints shall be a metal-to-metal flare seal with no gaskets and made with a stainless steel insert to pilot the tubing ID onto the fitting for a reliable flaring operation. Alternate Snap fitting listed with CSA International having an integral snap ring requiring no disassembly or reassembly with a metal to metal cup seal. Brass fitting

contains no gaskets, o-rings, or retainer rings and has a reduced torque value.

7. Quality Assurance- CSST shall be marked with the manufacturer's name, approving agencies, pressure rating.
8. Installer Qualifications- Each installer must meet applicable state and local requirements established by the AHJ and must be successfully trained through the manufacturer's installation program.
9. As an option CSST piping may be used for underground and above ground piping in accordance with the manufacturer's instruction. Pipe sizes shall be in accordance with manufacturer's requirement.

2.2 ACCESSORIES:

A. Gas Pressure Regulators: shall be diaphragm actuated with cast iron body, aluminum diaphragm chamber, and all internal parts designed for use with [natural] [LP] gas. Regulators shall be adjustable, with automatic loading, automatic low pressure cut-off, and full internal relief. The regulator shall be adjusted for outlet pressure indicated on the drawings. The outlet pressure shall not vary more than 1" w.c. from the set point at specified capacity. The regulator shall be capable of complete shut-off in the event the supply pressure is interrupted or the gas demand exceeds the regulator capacity and shall remain off until the regulator is manually reset. The regulator shall have a weatherproof, bug proof, screened vent cap installed in the vent tapping. Regulators shall be:

1. Regular:
 - a. Sensus (Rockwell)
 - b. Fisher
 - c. Singer
 - d. Maxitrol
 - e. Pietro Fiorentini
2. With Full Relief:
 - a. Sensus (Rockwell)
 - b. Fisher
 - c. Singer
 - d. Maxitrol
 - e. Pietro Fiorentini

B. Plug Valves: Valves shall have iron body (semi-steel) lubricated type cast bronze plug, and threaded ends rated for 175 psig W.O.G. working pressure. Plug valves shall be Rockwell, Walworth, Homestead, or Powell.

C. Shutoff Valves: Valves 2" and smaller shall be ball valves. Valves shall have threaded inlet and outlet connections, two-piece brass body, meeting MSS-SP110, full or standard port, blowout-proof stem, and adjustable packing nut independent of handle. Valves shall be ASME B16.44 and UL listed for use with gas. Valve shall be rated for 250 psi, 600 CWP. Valves shall be by Maxitrol, Apollo, Hays, Milwaukee, Nibco, or Watts.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING SYSTEM:

- A. General: Comply with the requirements of the Section 220310 for installation of basic piping materials. Install piping products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that products serve the intended function.
- B. Use sealants on metal gas piping threads which are chemically resistant to natural gas. Use sealants sparingly and apply to only male threads of metal joints.
- C. Remove cutting and threading burrs before assembling piping.
- D. Do not install defective piping or fittings. Do not use pipe with threads which are chipped, stripped, or damaged.
- E. Plug each gas outlet, including valves with a threaded cap or plug immediately after installation and retain until continuing piping or equipment connection is completed.
- F. Ground gas piping electrically and continuously within project, and bond to grounding electrode. Buried bare metal piping is acceptable as a grounding electrode.
- G. Install drip-legs in gas piping at regulator station and other low points in the system.
- H. Grade horizontal lines 1/4" in 15' to drip-legs.
- I. Support piping in accordance with the International Gas Code.
- J. For welded pipe, the contractor shall provide test weld piping coupons for review and approval by the owner's representative prior to commencing welding of gas piping.
- K. Protection of Gas Piping Against Corrosion: Protect metal gas piping in contact with the earth, or other corrosive material, against corrosion. Protect pipe with corrosion-resistant pipeline coating over a rubber-based primer by Polyken. Joints shall be primed and wrapped with Foster Cold-Applied Pipeline Joint Tape.
- L. Install underground piping with a minimum 18" of cover. Trench shall be graded to provide a firm, continuous bearing for pipe. Connections between plastic pipe and steel pipe shall be made only outside, underground, and with approved transition fittings.
- M. Coordinate with gas utility company as necessary to interface gas distribution piping with gas service supply work.
- N. Painting: All exposed metal gas piping outside the building shall be primed and painted with dark gray enamel. All gas piping inside the building shall be painted yellow enamel.

3.2 EQUIPMENT CONNECTIONS:

- A. General: Connect gas piping to equipment in accordance with the equipment manufacturer's instructions. Provide ground joint union and accessible cut-off valve at each connection to equipment.

3.3 FIELD QUALITY CONTROL:

- A. Fuel Gas Piping Tightness Test: Prior to initial operation, test gas distribution piping system with air or inert gas at 3 psig or two times operating line pressure, whichever is greater. Do not use oxygen for tests.

- B. Repair or replace fuel gas piping as required to eliminate leaks and retest as specified to demonstrate compliance.

END OF SECTION 221410

SECTION 221710 - PLUMBING VIBRATION AND SEISMIC CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SCOPE OF WORK:

- A. Furnish all labor, materials, tools, and equipment and perform all work necessary to complete the installation of the plumbing [vibration and] seismic control systems required by these specifications and as detailed on the drawings.
- B. All foundations and supports required for the installation of plumbing equipment shall be furnished by the plumbing contractor shall unless specifically specified otherwise.
- C. The following criteria applies to all mechanical systems and components:
 - 1. Seismic Design Category: D
 - 2. Typical Importance Factor: 1.0
 - 3. Gas Piping Importance Factor: 1.5
- D. Based on the criteria listed above, seismic restraints are required for Natural Gas piping only.

1.3 QUALITY ASSURANCE:

- A. Codes and Standards: The installation of the plumbing systems shall be installed in accordance with the following codes and standards. All seismic restraint systems such as sway bracing, cable restraints, seismic snubbers, seismic restraints, and vibration isolators shall also meet the requirements as set forth in the following current standards and codes.
 - 1. International Building Code (IBC)
 - 2. ASHRAE
 - 3. SMACNA Seismic Restraint Manual
 - 4. ASTM 488 Anchor Locations
 - 5. FEMA Standards
- B. The plumbing seismic control products shall be sized and provided by the manufacturers listed below. The manufacturer shall have tested all seismic products provided for the specific intended use and installation.
- C. Kinetics Noise Control is the Basis of Design manufacturer. Equivalent equipment by AeroSonics, Mason, Vibration Eliminator, Vibro-Acoustics and Vibration Mountings and Controls that meets performance, capacity, space, and other requirements of the design documents shall be acceptable.

D. Submittals:

1. The contractor shall submit for approval by the Design professional all products intended to be used to meet the requirements of these specifications. Submittal data shall include [a proposed schedule for vibration isolation products,] manufacturer's data and cut sheets of the specific [vibration isolation and] seismic control materials. [Proposed vibration isolation schedule shall list all equipment specified to be isolated, the equipment weight, proposed isolator type or base type, number of isolators required, spring or isolator color, and deflection of the spring or vibration isolator based on equipment weights.]
2. The contractor shall submit for approval by the Design professional all seismic anchorage requirements for all equipment. Anchorage calculations shall be prepared by a registered engineer and in the state where the project will be constructed. The engineer shall stamp calculations. Anchorage requirements shall be submitted for all base mounted equipment, suspended equipment, and roof mounted equipment. Seismic anchorage calculations shall include an "anchorage schedule" for the contractor's use. Anchorage schedule shall list the equipment, the size and quantity of fasteners and the minimum embedment depth of anchors. Calculations may be combined for similar types of equipment provided the size and weight does not vary more than 15% and the installation manner are similar.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. All equipment shall be mounted or suspended from approved foundations and supports as specified herein or as detailed on the drawings.

2.2 SEISMIC CONTROL:

- A. The mechanical systems serving the building shall be installed to meet the minimum requirements of the International Building Code regarding seismic protection and control. These specifications and the drawings indicate the minimum requirements and general intent. The actual requirements shall be determined by the seismic engineer and supplier and submitted for approval by the Design Professional.
- B. The seismic engineer shall be a registered engineer in the state in which the facility is constructed and whose principal area of practice is seismic engineering and related fields.
- C. All equipment installed either floor or pad mounted or suspended from the structure shall be restrained and anchored unless exempt as hereinafter indicated.
- D. Where pipes or other plumbing systems cross the seismic isolation interface between two seismically isolated structures, the systems shall have flexible pipes to accommodate the seismic displacement of the two structures. Flexible pipes shall be installed on one side of the interface.
- E. The following plumbing components are exempt from seismic bracing or restraints:

1. All components in seismic design category D, E, and F, weighing 20 lbs or less when the importance factor = 1.0.
 2. Piping installed 12” or less from the point of connection to the supporting structure and the top of the pipe when the importance factor = 1.0.
 3. Equipment installed less than 4’-0” above the floor and weighing less than 400 lbs when the importance factor = 1.0.
 4. Any piping installed in a structure when the Seismic Design Category is A or B.
 5. Any piping installed in a structure when the Seismic Design Category is C and the importance factor = 1.0.
- F. Seismic restraint cables or seismic restraint braces shall be installed on piping systems and suspended equipment. Seismic restraint cables shall be stranded steel cable provided with mounting hardware for connection to the equipment hanger rod, to the equipment housing or trapeze hangers. The stranded steel cables and hardware shall be the product of a single manufacture and shall have been tested for the intended use. Published data shall be available and submitted to identify the load limitations of the proposed restraint hardware. As a minimum the following cable sizes shall be used on piping and equipment:
1. Piping 1” to 2-1/2”:
1/16” steel cable
 2. Piping 3” to 8”:
3/16” steel cable
 3. Piping 10” and larger:
1/4” steel cable
 4. Equipment weighting 400 lbs or less:
3/16” steel cable
 5. Equipment weight 401 lbs and higher:
1/4” steel cable
- G. Anchorage of equipment to concrete floors and pads shall be in-accordance with the submitted anchorage calculations.
- H. Connections of seismic restraint cable hardware shall be in-accordance with the submitted anchorage calculations.
- I. Snubbers shall be installed for equipment installed on non-seismic type spring isolators.
1. Type S-1 snubbers shall be welded steel angles with mounting holes and a resilient neoprene pad applied to the angle surface that faces the equipment. Snubbers shall be installed on all four (4) sides of the equipment and shall limit the horizontal movement to 1/4”. A minimum of (4) snubbers will be required. Snubbers shall be attached to the floor or concrete pad with fasteners as indicated in the submitted seismic anchorage calculations.
 2. Type S-2 snubbers shall be multi-directional by design and consist of a base plate with a welded cylinder and a mating seismic restraint angle with guide hole to receive the seismic restraint cylinder. The seismic restraint cylinder shall have a neoprene tube around the circumference of the cylinder and provide a maximum of 1/8” horizontal movement of equipment. A minimum of (2) Type S-2 snubbers shall be installed on any (1) piece of equipment.
 3. Type S-3 snubbers shall be multi-directional plus vertically restrained type snubbers. Snubbers shall be fabricated of welded steel and consist of a base plate with welded vertical cylinder and a mating seismic restraint angle with guide hole to receive the vertical restraint cylinder. Additionally, the vertical restraint cylinder shall be threaded and provided with a limit bolt and washer that will limit the vertical movement as well as the horizontal movement of the equipment.

PART 3 - EXECUTION

3.1 GENERAL:

- A. If the equipment provided is not furnished with integral structural steel supports, mounting feet, or lifting lugs, the contractor shall provide miscellaneous steel shapes as required to install or suspend the equipment and attach the vibration isolation or seismic restraints as specified herein.
- B. Support steel shall include but not be limited to rails, brackets, angles, channels, and similar components.
- C. All seismic restraint products shall be installed as outlined in the manufacturer's printed installation instructions.

3.2 SEISMIC CERTIFICATE OF COMPLIANCE:

- A. The manufacturer's representative shall be responsible for providing such assistance and supervision as necessary to assure a correct installation and adjustment of [vibration isolation and] seismic products.
- B. The manufacturer's representative shall visit the installation once all installed items have been completed but prior to the installation of ceilings or walls that may conceal any devices and inspect the installation for compliance with the manufacturer's installation instructions. Upon satisfaction that all devices are installed correctly and systems are isolated properly, the representative shall submit a written report outlining the installation as in compliance with these specifications and also the manufacturer's installation instructions.

END OF SECTION 221710

SECTION 230110 – MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.
- B. It is recognized that separate sub-contracts may be instituted by THIS CONTRACT'S GENERAL CONTRACTOR with others. It is the responsibility of THIS CONTRACT'S GENERAL CONTRACTOR to completely inform, coordinate, and advise those sub-contractors of the requirements, conditions, and information associated with providing and installing their portion of the total job.

1.2 IMPOSED REGULATIONS:

- A. Applicable provisions of the State and Local Codes and of the following codes and standards in addition to those listed elsewhere in the specifications are hereby imposed on a general basis for mechanical work. In each case, the prevailing edition shall be the current adopted edition of the state where the project is located.
 - 1. *International Mechanical Code.*
 - 2. *International Gas Code.*
 - 3. *International Energy Conservation Code.*
 - 4. *International Fire Code.*

1.3 SCOPE OF WORK:

- A. Provide all labor, materials, equipment, and supervision to construct complete and operable mechanical systems as indicated on the drawings and specified herein. All materials and equipment used shall be new, undamaged, and free from any defects.

1.4 EXISTING SERVICES AND FACILITIES:

- A. **Damage to Existing Services:** Existing services and facilities damaged by the Contractor through negligence or through use of faulty materials or workmanship shall be promptly repaired, replaced, or otherwise restored to previous conditions by the Contractor without additional cost to the Owner.
- B. **Interruption of Services:** Interruptions of services necessary for connection to or modification of existing systems or facilities shall occur only at prearranged times approved by the Owner. Interruptions shall only occur after the provision of all temporary work and the availability of adequate labor and materials will assure that the duration of the interruption will not exceed the time agreed upon.
- C. **Removed Materials:** Existing materials made unnecessary by the new installation shall be removed, shall remain the property of the Owner and shall be stored at a location and in a

manner as directed, or, if classified by the Owner's authorized representative as unsuitable for further use, shall become the property of the Contractor and shall be removed from the site.

1.5 WARRANTIES:

- A. Provide manufacturer's standard printed commitment in reference to a specific product and normal application, stating that certain acts of restitution will be performed for the Purchaser or Owner by the manufacturer, when and if the product fails within certain operational conditions and time limits. Where the warranty requirements of a specific specification section exceed the manufacturer's standard warranty, the more stringent requirements will apply, and modified manufacturer's warranty shall be provided. The Contractor shall provide a warranty on all parts and labor per the Div 01 requirements.

1.6 PRODUCT SUBSTITUTIONS:

- A. General: Materials specified by manufacturer's name shall be used unless prior approval of an alternate is given by addenda. Requests for substitutions must be received in the office of the Design Professional at least (10) days prior to opening of bids.

PART 2 - PRODUCTS

2.1 GENERAL MECHANICAL PRODUCT REQUIREMENTS:

- A. Standard Products: Provide not less (quality) than manufacturer's standard products, as specified by their published product data. In addition to the indication that a particular product/model number is acceptable, comply with the specified requirements. Do not assume that the available off-the-shelf condition of a product complies with the requirements; as an example, a specific finish or color may be required.
- B. Uniformity: Where multiple units of a general product are required for the mechanical work, provide identical products by the same manufacturer, without variations except for sizes and similar variations as indicated.
- C. Product Compatibility, Options: Where more than one product selection is specified, either generically or proprietarily, selection is Purchaser's or Installer's option. Provide mechanical adaptations as needed for interfacing of selected products in the work.

PART 3 - EXECUTION

3.1 PRODUCT INSTALLATION, GENERAL:

- A. Except where more stringent requirements are indicated, comply with the product manufacturer's installation instructions and recommendations, including handling, anchorage, assembly, connections, cleaning and testing, charging, lubrication, startup, test operation and shut down of operating equipment. Consult with manufacturer's technical experts, for specific instructions on unique product conditions and unforeseen problems.

- B. Protection and Identification: Deliver products to project properly identified with names, model numbers, types, grades, compliance labels and similar information needed for distinct identifications; adequately packaged or protected to prevent deterioration during shipment, storage, and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior storage.

- C. Permits and Tests: Provide labor, material, and equipment to perform all tests required by the governing agencies and submit a record of all tests to the Owner or authorized representative. Notify the Design Professional five days in advance of any testing.

END OF SECTION 230110

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SECTION 230120 - MECHANICAL STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. Industry Standards: It is a general requirement that mechanical work comply with applicable requirements and recommendations of standards published by listed agencies and trade associations, except to the extent more detailed and stringent requirements are indicated or required by governing regulations.

B. Listing of Associations, Standards, and Abbreviations:

1. *AGA* *American Gas Association*
1515 Wilson Blvd.
Arlington, VA 22209
2. *AMCA* *Air Movement & Control Association*
30 W. University Dr., Arlington Heights, IL 60004
3. *ARI* *Air-Conditioning and Refrigeration Institute*
4301 North Fairfax Drive, Suite 425, Arlington, VA 22203
4. *ASHRAE* *American Society of Heating, Refrigerating &
Air Conditioning Engineers, Inc.*
1791 Tullie Circle, NE, Atlanta, GA. 30329
5. *AWS* *American Welding Society, Inc.*
2501 NW 7th St., Miami, FL 33125
6. *CISPI* *Cast Iron Soil Pipe Institute*
2020 K. St., NW, Washington, DC
7. *NEBB* *National Environmental Balancing Bureau*
1611 North Kent St.,
Arlington, VA 22209
8. *NEC* *National Electrical Code* by NFPA
9. *NEMA* *National Electrical Manufacturers Association*
1300 N 17th Street, Suite 1847
Rosslyn, VA 22209
10. *NFPA* *National Fire Protection Association*
407 Atlantic Ave.,
Boston, MA 02210
11. *SMACNA* *Sheet Metal & Air Conditioning Contractors National
Association, Inc.*
8224 Old Courthouse Rd., Tysons Corner
Vienna, VA 22180
12. *TIMA* *Thermal Insulation Manufacturers Association*
7 Kirby Plaza
Mt. Kisco, NY 10549
13. *UL* *Underwriters' Laboratories, Inc.*

207 East Ohio St.,
Chicago, IL 60611

PART 2 AND 3 - PRODUCTS AND EXECUTION

A. Not applicable.

END OF SECTION 230120

SECTION 230210 - MECHANICAL COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. Mechanical Coordination Plans: Prepare a set of coordination plans showing the coordination of the major elements, components, and systems of the mechanical work, and showing the coordination of mechanical work with other work. Prepare plans at accurate scale and sufficiently large to show locations of every item, including clearances for installing, maintaining, insulating, breaking down equipment, replacing motors and similar requirements. Prepare plans to include plans, elevations, sections, and details as needed to conclusively show successful coordination and integration of the work. Submit plans for review by the Design Professional. Coordination plans shall be submitted for the following areas: All mechanical equipment rooms.
- B. Coordinate the actual location of all mechanical work visible in finished spaces with the Design Professional. This includes air distribution devices, exposed ductwork, thermostats, humidistats, switches, sensors, etc.
- C. Mechanical Coordination Affidavit: Prior to ordering materials, provide the Coordination Affidavit required by Section 230220.

PART 2 - PRODUCTS

2.1 MECHANICAL PRODUCT COORDINATION:

- A. Power Characteristics: Refer to the electrical sections of the specifications and the electrical drawings for the power characteristics available for the operation of each power-driven item of equipment. The electrical design was based on the typical power requirements of the equipment manufacturers scheduled or specified. Any modifications to the electrical system which are required due to the use of an approved equivalent manufacturer shall be made at no additional cost to the owner. All changes must be clearly documented and submitted for review by the Design Professional prior to purchasing equipment. Coordinate purchases to ensure uniform interface with electrical work. The mechanical contractor shall furnish a detailed list of equipment electrical characteristics to the electrical contractor for the purpose of preparing the coordination affidavit required by Division 26.
- B. Coordination of Options and Substitutions: Where the contract documents permit the selection from several product options, and where it becomes necessary to authorize a substitution, do not proceed with purchasing until coordination of interface of equipment has been checked and satisfactorily established.

- C. Firestopping: Refer to architectural drawings for the locations of all fire rated ceilings, floors, and walls. The contractor shall furnish detailed shop drawings of all firestopping details to be used for both piping and ductwork. All firestopping details shall be U.L. listed and subject to approval by the State Fire Marshal.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION:

- A. Substrate Examination: The Installer of each element of the mechanical work must examine the condition of the substrate to receive the work, and the conditions under which the work will be performed and must notify the Contractor in writing of conditions detrimental to the proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
- B. Do not proceed with the installation of sleeves, anchors, hangers, roof penetrations and similar work until mechanical coordination drawings have been processed and released for construction. Where work must be installed prior to that time to avoid a project delay, review proposed installation in a project coordination meeting including all parties involved with the interfacing of the work.

3.2 CUTTING AND PATCHING:

- A. Structural Limitations: Do not cut structural framing, walls, floors, decks, and other members intended to withstand stress, except with the Design professional written authorization.
- B. Where authorized, cut opening through concrete (for pipe penetrations and similar services) by core drilling or sawing. Do not cut by hammer-driven chisel or drill.
- C. Other work: Do not endanger or damage other work through the procedures and processes of cutting to accommodate mechanical work. Review the proposed cutting with the Installer of the work to be cut and comply with recommendations to minimize damage. Where necessary, engage the original Installer or other specialists to execute the cutting in the recommended manner.
- D. Where patching is required to restore other work, because of either cutting or other damage inflicted during the installation of mechanical work, execute the patching in the manner recommended by the original Installer. Restore the other work in every respect, including the elimination of visual defects in exposed finishes, as judged by the Design Professional. Engage the original Installer to complete patching of the following categories of work:
 1. Exposed concrete finishes and exposed masonry.
 2. Waterproofing and vapor barriers.
 3. Roofing, flashing and accessories.
 4. Interior exposed finishes and casework, where judged by the Design Professional to be difficult to achieve an acceptable match by other means.

3.3 COORDINATION OF MECHANICAL INSTALLATION:

- A. General: Sequence, coordinate and integrate the various elements of mechanical work so that the mechanical plant will perform as indicated and be in harmony with the other work of the building. The Design Professional will not supervise the coordination, which is the exclusive responsibility of the Contractor. Comply with the following requirements:
1. Install piping, ductwork, and similar services straight and true, aligned with other work and with overhead structures and allowing for insulation. Conceal where possible.
 2. Arrange work to facilitate ease of maintenance and repair or replacement of equipment and filters. Locate items requiring more maintenance such as valves, etc. in front of items requiring less maintenance. Connect equipment for ease of disconnecting, with minimum of interference with other work.
 3. Equipment located above ceilings shall be installed in a position and elevation which allows complete and adequate maintenance access through the ceiling grid or access panel while standing safely on a ladder. If this is not possible, a suitable maintenance platform must be provided per IMC.
 4. Give the right-of way to piping systems required to slope for drainage (over other service lines). Piping shall be located to avoid interference with ductwork and light fixtures.
 5. Store materials off the ground and protected from standing water and weather.
- B. Drawings: Conform with the arrangement indicated by the contract documents to the greatest extent possible, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, comply with the Design Professional's decision on resolution of the conflict.
- C. Electrical Work: Coordinate the mechanical work with electrical work, and properly interface with the electrical service. In general, and except as otherwise indicated, install mechanical equipment ready for electrical connection. Refer to electrical sections of the specifications for electrical connection of mechanical equipment.
- D. Duct Smoke Detectors: In buildings equipped with a fire alarm system, all HVAC duct smoke detectors, including smoke detectors for smoke dampers, shall be furnished by Division 26 and installed by Division 23. All duct smoke detectors must be compatible with the fire alarm system and must be connected to the fire alarm system for notification. All fire alarm wiring and associated devices shall be furnished and installed by the fire alarm system installer. In buildings not equipped with a fire alarm system, all HVAC duct smoke detectors and accessories shall be furnished and installed by Division 23. Each duct smoke detector must have a remote device where actuation of the duct smoke detector shall activate a visible and an audible signal in an approved location. Duct smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as "Air Duct Detector Trouble." Each smoke detector shall be wired into the respective fan control circuit to automatically shut down the fan upon sensing products of combustion.
- E. Utility Connections: Coordinate the connection of mechanical systems with exterior underground utilities and services. Comply with the requirements of governing regulations, franchised service companies and controlling agencies. Provide a single connection for each service except where multiple connections are indicated.

3.4 COORDINATION OF MECHANICAL STARTUP:

- A. Seasonal Requirements: Adjust and coordinate the timing of mechanical system start-ups with seasonal variations, so that demonstration and testing of specified performance can be

observed and recorded. Exercise proper care in off-season start-ups to ensure that systems and equipment will not be damaged by the operation.

- B. Painting and Air Distribution: Coordinate the initial cleaning and start-up of the air distribution system, to occur prior to preparatory cleaning and general interior painting and decorating on the project. The HVAC system should not be operated until drywall work is completed. Drywall dust must not be allowed to contaminate the interior of air handling units and ductwork. Use high efficiency temporary filters until project closeout.

END OF SECTION 230210

SECTION 230220 - MECHANICAL SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTAL FORMS AND PROCEDURES:

- A. The purpose of submittals is to demonstrate to the Design Professional that the Contractor understands the design concept. The Design Professional's review of such drawings, schedules, or cuts shall not relieve the Contractor from responsibility for deviation from drawings or specifications unless he has, in writing, called the Design Professional's attention to such deviations at the time of submission, and has received from the Design Professional, in writing, permission for such deviations. All submittals must be completely checked by the Contractor prior to submission for review.
- B. Hard Copy Submittals: Submittal data shall be placed in one or more hard-back 3-ring binders, arranged, and labeled according to specification section. Each binder shall contain a title page and table of contents. Provide separator tabs, and label by specification section. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 23 Superintendent's name, Suppliers and point of contact for each, and date. Except as otherwise indicated in other sections, submit 5 complete copies. Quantity indicated does not include copies required for regulatory agencies.
- C. Electronic Submittals: All electronic submittal files shall be organized to match the bid documents for specification section and name. Each submittal file shall be complete for each specification section. Multiple partial submittals per specification section will be rejected. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 23 Superintendent's name, Suppliers and point of contact for each, and date.
- D. Submittals shall be made for all items contained in the Mechanical Submittal List in PART 3 - EXECUTION.
- E. Response to Submittals: A Mechanical Submittal Review Report shall be issued by the Engineer with the following classifications for each item:
 - 1. "No Exceptions Taken": No corrections, no marks. Contractor shall submit copies for distribution.
 - 2. "Make Corrections Noted": A few minor corrections. Items may be ordered as marked up without further resubmission. Submit copies for distribution.
 - 3. "Revise and Resubmit": Minor corrections. Item may be ordered at the Contractor's option. Contractor shall resubmit drawings with corrections noted.
 - 4. "Rejected": Major corrections or not in accordance with the contract documents. No items shall be ordered. Contractor shall correct and resubmit drawings.

PART 2 - PRODUCTS

2.1 SUBMITTAL REQUIREMENTS:

- A. General: Each specification section shall list the required submittal items. All submittal items shall conform to the requirements listed below. For each major section of submittal data, include a summary page which lists items and model numbers for each piece of equipment.
- B. Shop Drawings: Prepare mechanical shop drawings to accurate scale except where diagrammatic representations are specifically indicated. Show clearance dimensions of critical locations and show dimensions of spaces required for operation and maintenance of equipment. Show piping connections and other service connections and show interface with other work including structural support. Indicate by note, the portions of mechanical work shown on the shop drawings which deviated from the indication of work in the contract documents and explain the reasons for the deviations. Show how such deviations coordinate with interfacing deviations on shop drawings for other portions of the work, currently or previously submitted.
- C. Manufacturer's Data: Where pre-printed data is submitted for more than one distinct product, size, type, material, trim, accessory group or other variation, mark submitted copy with black pen to indicate which of the variations is to be provided. Delete or mark-out significant portions of preprinted data which are not applicable. Where operating ranges are shown, mark data to show portion of range required for project application. Expansion or elaboration of standard data to describe a non-standard product must be processed as a shop drawing submittal. For each product include the manufacturer's production specifications, installation or fabrication instructions, nearest source of supply (including telephone number), sizes, weights, speeds, operating capacities, piping and service line connection sizes and locations, statements of compliance with required standards and governing regulation (include manufacturer's signed statements if not covered in printed data), performance data (where applicable) and similar information needed to confirm compliance with the requirements.
- D. ATTACHMENT NO. 1 (Mechanical Coordination Affidavit):
 - 1. The intent of Attachment Number 1 is to ensure that the electrical requirements for mechanical equipment have been reviewed and coordinated by the Contractor. No mechanical equipment shall be ordered, nor shall rough-in begin, before this coordination has taken place. This document shall be returned appropriately marked whether or not any changes are deemed to be necessary by the contractor.

PART 3 - EXECUTION

3.1 MECHANICAL SUBMITTAL LIST:

- 23 0210 – Mechanical Coordination:
 - Mechanical Coordination Plans.
 - Mechanical Coordination Affidavit (see Attachment No. 1 below)
- 23 0230 – Mechanical Identification:

- Engraved Nameplates.
- 23 0240 – Mechanical Work Closeout:
Record Plans.
Maintenance Manuals.
Mechanical TAB Report.
Owner Training Videos.
- 23 0310 – Mechanical Pipe, Tube, and Fittings:
PVC Pipe.
PVC Cement.
Latex Paint for PVC Pipe.
- 23 0320 – Mechanical Hangers and Supports:
Pipe Supports, Guides, Shields, and Saddles.
Piping Roof Supports.
- 23 2110 – Ductwork:
Duct Construction Standards.
Galvanized Steel Ducts.
Flexible Ducts.
Flexible Connectors.
Manual Balancing Dampers.
Automatic Balancing Dampers.
Round Takeoff Fittings.
Rectangular Takeoff Fittings.
Fire Dampers.
Duct Access Doors.
Flexible Duct Elbow Support.
Duct Wrap Type ‘A’.
Duct Board.
Duct Insulation Accessories.
Duct Insulation Compounds.
Duct Sealant.
Weatherproof Duct Sealant.
- 23 2120 – Duct Cleaning:
Duct Cleaning Company Qualifications.
IAQ Quality Control Assurance Program.
- 23 2210 – Air Distribution:
All devices in AIR DISTRIBUTION SCHEDULE and/or plans and/or specifications.
- 23 4320 – Air Treatment Systems:
All equipment in noted in equipment schedules and/or plans and/or specifications.
- 23 7210 –Energy Recovery Ventilators:
All equipment in ENERGY RECOVERY VENTILATOR SCHEDULE and/or plans and/or specifications.
- 23 9110 – Mechanical Sound, Vibration, Wind, and Seismic Control:
Wind Calculations for all roof mounted equipment.

All equipment in plans and/or specifications.

23 9210 – Mechanical TAB (Test, Adjust, Balance):

Qualifications package.

Testing procedures.

Instrument list.

Sample test forms.

END OF SECTION 230220

ATTACHMENT NO. 1

SHOP DRAWING COORDINATION AFFIDAVIT

I, the Division 23 Superintendent, certify that I have reviewed the mechanical shop drawings for electrically driven equipment and that the accompanying mechanical shop drawings reflect the requirements of the actual equipment to be furnished for use on this project. In addition, the electrical requirements of said equipment have been coordinated with the Division 26 contractor.

NOTE: If no deviations are required please indicate by circling the appropriate answer above your signature.

PROJECT: _____ DEVIATIONS: Yes / No

COMPANY: _____

TITLE: _____ SIGNATURE: _____

TELEPHONE: _____ DATE: _____

FAILURE TO PERFORM THE WORK REQUIRED BY THIS AFFIDAVIT, PRIOR TO ORDERING MATERIALS OR ROUGHING-IN, MAY RESULT IN IMPROPER CONNECTIONS BEING PROVIDED. THE EXPENSE OF CORRECTIVE MEASURES, IF REQUIRED, SHALL BE BORNE BY THE CONTRACTOR.

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SECTION 230230 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in the manufacture of identification systems required for this product.
- B. Submittals: Submit manufacturer's data on materials and submit a sample of each type required.

PART 2 - PRODUCTS

2.1 MECHANICAL IDENTIFICATION MATERIALS:

A. Engraved Plastic-Laminate Labels:

1. General: Provide engraving stock melamine plastic laminated, complying with FS L-P-387, in the sizes and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core, letter color, except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
2. Thickness: 1/16", except as otherwise indicated.
3. Fasteners: Self-tapping stainless-steel screws, except contact type permanent adhesive where screws cannot or should not penetrate the substrate.
4. Install engraved equipment labels on all mechanical equipment. Match equipment names as scheduled.

2.2 LETTERING AND GRAPHICS:

- A. General: Coordinate names, abbreviations and other designations used in the mechanical identification work, with the corresponding designations shown, specified, or scheduled. Provide numbers, lettering recommended by manufacturers or as required for proper identifications and operation/maintenance of the mechanical systems and equipment.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION:

- A. Coordination: Where identification is to be applied to surfaces which require insulation, painting and other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering or painting.
- B. All equipment, dampers, filters, valves, etc. located above ceiling grids shall be located with an engraved marker permanently attached to the ceiling grid. The marker shall describe the item located above the ceiling.
- C. Piping System Identification: Install pipe markers on each system indicated to receive identification and include arrows to show normal direction of flow.
- D. Locate pipe markers as follows wherever piping is exposed to view in mechanical rooms, accessible maintenance spaces (including accessible areas above ceilings) and exterior non-concealed locations:
 - 1. Near each valve and control device.
 - 2. Near each branch, excluding short take-offs for fixtures. Mark each pipe at branch, where there could be a question of flow pattern.
 - 3. Near locations where pipes pass through walls or ceilings or enter non-accessible enclosures.
 - 4. Near major equipment items and other points of origination and termination.
 - 5. Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.
- E. Do not mark piping exposed in finished occupied spaces.
- F. Mechanical Equipment Identification: Install an engraved plastic laminate label on or near each major item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device. Each label shall include the equipment name, room number and electrical panel name. Confirm installed final room numbers and electrical panel names prior to ordering labels.
- G. Valve tags shall be attached to the valve handwheel with cable ties.

END OF SECTION 230230

SECTION 230240 - MECHANICAL WORK CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DOCUMENTATION PROCEDURES:

- A. Signed Commitments: Do not proceed with transfer of mechanical plant to the Owner for operation until warranties, performance certifications and similar commitments to be signed by Contractor and other entities have been executed and transmitted to Design Professional (for Owner's records).

PART 2 – PRODUCTS

2.1 RECORD PLANS:

- A. Explanation: Except where otherwise indicated, mechanical plans (contract plans) prepared by Engineer are diagrammatic in nature and may not show locations accurately for various components of mechanical systems. Shop drawings, including coordination plans, prepared by Contractor shall show certain portions of work more accurately to scale and location, and in greater detail.
- B. General Recording Procedure: Maintain a white-print set, blue-line or black-line, of mechanical contract plans and shop drawings in clean, undamaged condition, for mark-up of actual installations which vary substantially from the work as shown. Mark-up whatever plans are most capable of showing the installed conditions accurately; however, where shop drawings are marked, record a reference note on appropriate contract drawing. Mark with erasable pencil and use multiple colors to aid in the distinction between work of separate mechanical systems. In general, record every substantive installation of mechanical work which previously is either not shown or shown inaccurately, but in any case record the following:
 1. Underground and aboveground piping, both exterior and interior, drawn to scale and fully dimensioned.
 2. *"Mechanical Project Record"* shall be maintained as part of the *"Project Record"* specified in Division 1.

2.2 MAINTENANCE MANUALS:

- A. Organize each copy of the required system maintenance manuals to include an index followed by thumb-tab marked sections for each of the following:
 1. Operating Instructions: Submit manufacturer's operating instructions for each item of mechanical equipment and supplement with additional project application instructions

where necessary. Prepare and submit specific operating instructions for charging, start-up, control or sequencing of operation, phase, or seasonal variations, shut-down, safety and similar operational instructions. Prepare in typewritten form in completely explained and easily understood English language.

2. Emergency instructions including addresses and telephone numbers of service sources.
 3. Regular system maintenance procedures including lubrication.
 4. List of all filters required for each unit.
 5. Spare parts listing and stocking recommendations.
 6. Inspection, adjusting, rebalancing, cleaning, parts replacement, and similar maintenance instructions and recommendations, including the proper use of tools and accessories.
 7. Valve schedule and control diagram for each system.
 8. Manufacturer's data and test reports for each operating item in each system.
 9. Manufacturer's product warranties and guarantees relating to the system and equipment items in the system.
 10. Corrected or approved issues of submittal items relating to the system.
- B. Bind each maintenance manual in one or more vinyl-covered, 2", 3-ring binder, plus pocket-folder type binders for folded drawings, and mark the back spine of each binder with system identification and volume number.
- C. Certifications: Where specifically indicated, submit with notarized execution.
- D. Test Reports: Submit test reports which have been signed and dated by the firm performing the test and prepared in the manner specified in the standard or regulation governing the test procedures as indicated.
- E. Manufacturer's Product Warranties: Where pre-printed and published warranty includes substantial deviation from required warranty (as judged by the Design Professional or Engineer), product is automatically disqualified from use on the project, except where manufacturer prepares and issues a specific product warranty on the product, stating that it is in lieu of the published warranty, and is executed by an authorized officer, and complies with the requirements. Warranties shall comply with the requirements of individual specification section where those requirements exceed the manufacturer's standard warranty.
- F. Guarantees: Where indicated as "Certified", provide guarantee which, in addition to execution by an authorized officer of each guarantor, is attested to by the Secretary of each guarantor and bears the corporate seal

2.3 MECHANICAL TEST, ADJUST, BALANCE REPORT:

- A. See Section 239210.

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES:

- A. General Coordination: Sequence closeout procedures properly, so that work will not be endangered or damaged, and so that every required performance will be fully tested and demonstrated.

- B. System Performance Test Run: At the time of mechanical work closeout, check each item in each system to determine that it is set for proper operation. With Owner's representative and Design Professional present, operate each system in a test run of appropriate duration to demonstrate compliance with performance requirements. During or following test runs, make final corrections or adjustments of system to refine and improve performances wherever possible, including noise and vibration reductions, elimination of hazards, better response of controls, signals and alarms, and similar system performance improvements. Provide testing or inspection devices as may be requested for Design Professional's observation of actual system performances. Demonstrate that controls and items requiring service or maintenance are accessible. Test run shall be scheduled to coincide with Design Professional's final inspection of the mechanical work.
- C. Cleaning and Lubrication: After final performance test run of each mechanical system, clean system both externally and internally. Clean dirt and debris from air handling systems and install new filters. Flush piping system by operating drains and similar means, and clean strainers and traps. Lubricate both power and hand operated equipment and remove excess lubrication. Touch-up minor damage to factory painted finishes and other painting specified as mechanical work; refinish work where damage is extensive.
- D. General Operating Instructions: In addition to specified training of Owner's operating personnel specified in individual mechanical sections, and in addition to preparation of written operating instructions and compiled maintenance manuals specified, provide general operating instructions for the total mechanical plant. Conduct a walk-through explanation and demonstration for orientation and education of Owner's personnel to be involved in continued operation of building and its mechanical plant.
1. Describe each basic mechanical system and how its control system functions, including flow adjustments, temperature control and similar operations.
 2. Explain and point out identification system, displayed diagrams, signals, alarms and similar provisions of the work.
 3. Describe basic sequencing requirements and interlock provisions for system start-up, phasing, coast-down, shut-down, and seasonal operations.
 4. Emphasize emergency procedures and safety provisions for protection of equipment and safety of occupants during equipment malfunction, disasters, power failures and similar unusual circumstances, and describe system limitations and precautions including weather adjustments.
 5. Outline basic maintenance procedures.
- E. Demonstrate what adjustments have been made and can continue to be made to reduce noise and vibration, improve system output, decrease energy consumption and similar performance improvements.
- F. Point out operational security provisions, safety, unavoidable hazards, and similar operator limitations. Display and conduct a "thumb-through" explanation of maintenance manuals, record drawings, meter readings and similar service items.
- G. All training sessions shall be digitally recorded (audio/video) and submitted to the Owner.
- H. Construction Equipment: After completion of performance testing and Owner's operating instructions and demonstrations, remove installers tools, test facilities, construction equipment and similar devices and materials used in execution of the work but not incorporated in the work.

3.2 CONTINUED SYSTEM OPERATIONS:

- A. Final Acceptance: At time of substantial completion of mechanical work, Owner's operating personnel will take over operation of mechanical systems. However, until time of final acceptance, respond promptly with consultation and services on whatever operation or maintenance problems may remain or arise in continued operation of mechanical plant.

END OF SECTION 230240

SECTION 230310 – MECHANICAL PIPE, TUBE AND FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

A. Industry Standards:

1. Qualify welding procedures, welders, and operators in accordance with ASME B31.1 for shop and project site welding of piping work.
2. Certify welding of piping work using the *Standard Procedure Specifications* by, and welders tested under supervision of, the *National Certified Pipe Welding Bureau*.
3. Where plastic piping is indicated to transport potable water, provide pipe and fittings bearing approval label by the *National Sanitation Foundation (NSF)*.

B. Submittals:

1. Submit manufacturer's data, welding certifications, test reports, and product warranties as applicable for all piping materials.
2. Grooved joint couplings and fittings and press joint fittings shall be shown on drawings and product submittals and be specifically identified with the applicable style number.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS:

- A. General: Provide pipe and tube of the type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by Installer for installation requirements and comply with governing regulations and industry standards.

- B. Black Steel Pipe: *ASTM A 53*, Schedule 40.

C. Plastic Pipe:

1. PVC-WATER: *ASTM D2466-88*:

2.2 PIPE/TUBE FITTINGS:

- A. General: Provide factory-fabricated fittings of the type, materials, grade, class, and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube valve or equipment connections in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.

- B. Cast-Iron Threaded Fittings for Steel Pipe: *ASTM A 126-84* Class 125, plain or galvanized to match pipe.
- C. Welded Fittings for Steel Pipe: *ASTM A234*.
- D. Solvent Cement for PVC Joints: *D2564-88*.
- E. Pipe Sleeves:
 - 1. Iron Pipe Sleeves: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.
 - 2. Sheet Metal Pipe Sleeves: Fabricate from galvanized sheet metal closed with lock-seam joints. For following pipe sizes provide gauge indicated: 3" pipe and smaller, 20-gauge; 4" to 6" pipe, 16-gauge; over 6" pipe, 14-gauge.
 - 3. Pipe Sleeve Caulking: *3M Fire Barrier Caulk, STI or Grabber*.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Install pipe, tube, and fittings in accordance with recognized industry practices which will achieve permanently-leakproof piping systems, capable of performing each indicated service without piping failure. Install each run with a minimum of joints and couplings, but with adequate and accessible unions for disassembly and maintenance/ replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance.
 - 1. Comply with *ASME B31.1* Code for Pressure Piping.
 - 2. Comply with *ASME B31.9* Code for Building Services Piping.
- B. Locate piping runs as indicated on the drawings. Route vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown, or described by diagrams, details, and notations or, if not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building and its equipment. Where possible, locate insulated piping for 1" clearance outside insulation. Changes in direction shall be made with fittings.
- C. Piping System Joints: Provide joints of the type indicated in each piping system.
- D. Threaded Joints: Thread pipe in accordance with *ANSI B2.12*; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed.
- E. Welded Joints: Weld pipe joints in accordance with recognized industry practice and as follows: Weld pipe joints only when ambient temperature is above 0 F. where possible. Bevel pipe ends at a 37.5-degree angle where possible, smooth rough cuts and clean to remove slag, metal particles and dirt. Install welding rings for butt welded joints. Use pipe clamps or tack-weld joints with 1" long welds; (4) welds for pipe sizes to 10". Build up welds with a stringer-bead pass, followed by a hot pass, followed by a cover or filler pass.

- Eliminate valleys at center and edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow holes and non-metallic inclusions. Do not weld-out piping system imperfections by tack-welding procedures; refabricate to comply with requirements. Install forged branch-connection fittings wherever branch pipe is indicated or install regular "T" fitting (at Contractor's option).
- F. Plastic Pipe/Tube Joints: Comply with manufacturer's instructions and recommendations and with applicable industry standards.
 - G. Insulating (Dielectric) Nipples: Comply with manufacturer's instructions for installing nipples in a manner which will prevent galvanic action and stop corrosion where the joining of ferrous and non-ferrous piping occurs.
 - H. Pipe Sleeves: Install pipe sleeves of the types specified wherever piping passes through the walls, floors, or structural members of the work. Provide sleeves of adequate size, accurately centered in pipe runs. Size sleeves so that piping and insulation will have free movement in the sleeve, including allowance for thermal expansion. Where insulation includes a vapor barrier covering provide sleeve with sufficient clearance for installation of vapor barrier. Install length of sleeve equal to thickness of construction penetrated, except extend floor sleeves 1/4" above floor finish. Provide temporary support of sleeves during placement of concrete and other work around sleeves and provide temporary closure to prevent concrete and other materials from entering pipe sleeves.
 - 1. Sleeve Type: At interior partitions and ceilings, install sheet metal sleeves.
 - 2. Sleeve Type: At exterior penetrations both above and below grade, install iron pipe sleeves.
 - 3. Sleeve Type: Except as otherwise specified, install steel pipe sleeves.
 - 4. Caulk pipe sleeves at exterior penetrations and at other locations where indicated.
 - I. PVC piping exposed to sunlight shall be coated with water-based latex white paint to prevent UV light degradation.

3.2 CLEANING, FLUSHING, AND INSPECTING:

- A. General: Clean exterior surfaces of installed piping systems of superfluous materials and prepare for application of specified coatings.
- B. Flush out piping system with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

3.3 PIPING TESTS:

- A. General: Provide temporary equipment for testing, including pump and gages. Test piping systems before insulation is installed wherever feasible and remove control devices before testing. Test each natural section of each piping system independently, but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating.
 - 1. Required test period is 2 hours.
- B. Unless otherwise specified for specific systems, hydraulically test each pressurized piping system at 150% of operating pressure indicated, but not less than 100 psig test pressure.

- C. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 5% of test pressure.

- D. Repair piping systems sections which fail the required piping test, by disassembly and re-installation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compound, mastics, or other temporary repair methods. Drain test water from piping systems after repair work and retesting has been completed.

END OF SECTION 230310

SECTION 230320 – MECHANICAL HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties on all items.

PART 2 - PRODUCTS

2.1 HANGERS AND SUPPORTS:

- A. General: Except as otherwise indicated, provide factory-fabricated piping hangers, and supports of the type specified complete with bolts and washers. Comply with the manufacturer's published product information. Size hangers and supports properly for piping and weight of the medium being transported. Provide insulation shields for all insulated piping.
- B. Piping installed above a roof shall be supported on prefabricated, non-penetrating supports by *Pipe Pier, B-Line* or *Cooper*. Provide matching adjustable elevation kits and method for positive attachment to roof.

PART 3 - EXECUTION

3.1 PIPING SUPPORT:

- A. Minimum spacing of hangers and supports for above-ground horizontal and vertical pipe and tubing shall be as required in the applicable *International Mechanical Code*.
- B. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated, or by other recognized industry methods.
- C. Branch piping located in walls, partitions or pipe chases shall be rigidly supported inside the wall or chase.

3.2 ADJUSTMENT OF HANGERS AND SUPPORTS:

- A. Adjust hangers and supports to bring piping to proper level, elevations, and slopes.

END OF SECTION 230320

SECTION 232110 - DUCTWORK AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

A. Industry Standards:

1. Comply with *SMACNA (Sheet Metal and Air Conditioning Contractor's National Association)* recommendations for fabrication, construction and details and installation procedures, except as otherwise indicated.
2. Comply with *ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers)* recommendations, except as otherwise indicated.
3. Provide composite ductwork insulation (insulation, coverings, sealers, mastics, and adhesives) with flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as tested by *ASTM E84 (NFPA 255)* method.
4. Provide duct connectors which comply with applicable portion of *UL 181* and bear label of *Underwriter's Laboratories*.

1.3 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties as applicable for all items.

PART 2 - PRODUCTS

2.1 ABOVE GROUND DUCTWORK:

- A. General: Galvanized steel ductwork shall be used for all supply, return, exhaust, and ventilation ducts except as indicated otherwise by the contract documents. Preinsulated flexible duct shall be used to make final concealed connections to diffusers, registers, and grilles. Length of flexible duct shall not exceed 5'.
- B. Galvanized Steel Ductwork: Ducts shall be fabricated from G90 galvanized sheet steel complying with ASTM A653, lock-forming quality. Concealed round ducts shall be the spiral seam type or snap-lock type with matching fittings.
- C. Flexible Ducts: Flexible ducts shall be *U.L. Listed as Class 1 Flexible Air Duct Material* and shall comply with *NFPA Standards 90A and 90B*. Duct shall be a factory fabricated assembly composed of a polymeric liner duct bonded permanently to a coated spring steel wire helix and supporting a fiberglass insulating blanket with a minimum R-value of 6.0. Low permeability outer vapor barrier of fiberglass reinforced film laminate shall complete the assembly. Duct shall be suitable for low and medium pressure systems and shall carry a full

5-year warranty. For all flexible duct connections to diffusers, registers, and grilles, provide rigid elbow brace accessory with one duct diameter centerline radius. Flexible duct shall be by *Atco*, *Flexmaster*, *Genflex*, or *Thermaflex*.

2.2 DUCTWORK ACCESSORIES:

- A. General: Except as otherwise indicated for each ductwork accessory, provide metal type, gauge, weight, construction and reinforcing as required by size limitations, and applicable SMACNA standards, including fittings, supports and appurtenances.
- B. Flexible Connectors: Provide flexible connectors between supply and return duct connections to equipment and as otherwise indicated on the drawings. Flexible connector shall be constructed of neoprene permanently attached to 3” wide metal bands. Connector shall be *UL* listed and shall be by *Durodyne*, *Ventfabrics*, *Cain*, or *Ductmate*.
- C. Flexible Duct Elbow Support: Support shall be a radius forming composite polymer brace designed to form flexible duct into a 90-degree elbow. Support shall be *UL* approved for use in a return air plenum and sized to accommodate 4” to 16” flexible ductwork. Support shall be by *FlexRight*, *Thermaflex*, *Titus*, *Malco*, or *ThermoFlo*.
- D. Manual Balancing Dampers: Provide single blade dampers for round ducts and rectangular ducts less than 12” as indicated on the drawings. Dampers shall be constructed of galvanized steel. Damper shall be installed complete with locking quadrants. For rectangular ducts 12” and wider, provide opposed-blade type dampers constructed of galvanized steel mounted in a galvanized steel channel frame. Blade spacing shall not exceed 6” and the top and bottom edges of the blades shall be crimped to stiffen the blades. Damper blades shall be interconnected by rods and linkages to provide simultaneous operation of all blades. Damper shall be provided with an extended rod to permit installation of a damper regulator. Dampers shall be by *Air Balance*, *Arrow*, *Dowco*, *Jer-Air*, *Nailor*, *National Controlled Air*, *Ruskin*, *Phillips-Aire*, *Safe-Air*, or *United Enertech*.
- E. Round Take-Offs: Round take-offs shall be made using collars constructed of galvanized steel equipped gasket flange and manual balancing damper with 2” handle standoff. Do not furnish extractors or air scoops. Takeoffs from VAV system trunk ducts to terminal units shall have a conical entry. Take-offs from low pressure trunk ducts shall have 45-degree entry. Takeoffs shall be by *Celcon*, *Crown*, *Flexmaster*, *Jer-Air*, *Metalcraft*, *Sheet Metal Connectors*, or *Thermaflex*.
- F. Fire Dampers (Walls and Floors): Provide curtain type, hinged blade, vertical and/or horizontal mounting fire dampers, suitable for duct penetration or opening protection as required on the drawings. Style ‘A’ dampers shall be used at wall register/grille locations. Style ‘B’ dampers shall be used at duct penetrations. Dampers shall meet the requirements of *NFPA 90A* and *UL-555*. Frame shall be minimum 20-gauge galvanized steel with 165 F fusible link. Blades shall be minimum 24-gauge galvanized steel. Dampers shall be by *Air Balance*, *Greenheck*, *Nailor*, *National Controlled Air*, *Phillips-Aire*, *Prefco*, *Ruskin*, *Safe-Air*, or *United Enertech*.
- G. Duct Access Doors: Duct access doors shall be provided at all fire dampers, smoke dampers, combination fire/smoke dampers, and at control items mounted within ducts. Access doors shall be the double-wall insulated type constructed of galvanized steel not less than 24-gauge

for the door and 22-gauge for the frame. Insulation shall be 1” thick and shall be rigid and self-sealing. Doors shall have cam locks on at least two sides. Frame shall have knock over edges for attachment to duct by preening and a vinyl gasket shall be provided between duct and frame. Doors shall match the pressure rating of the ductwork system and be as large as possible and as close as possible to the item served. Door shall be by *Air Balance, Greenheck, Nailor, National Controlled Air, Phillips-Aire, Prefco, Ruskin, Safe-Air, or United Enertech*.

2.3 DUCTWORK INSULATION:

- A. General: Refer to the mechanical plans for duct insulation types and locations. Insulation shall be by *Cerainteed, Knauf, Manville, or Owens Corning*.
- B. Duct Wrap: Type “A” Duct wrap shall be 2” thick, 0.75 pcf density, blanket type fiberglass insulation with vapor barrier and minimum R-Value of 6.7.
- C. Duct Board: Exterior board type insulation shall be 2” thick, 3 pcf density with minimum R-Value of 8.0. Insulating board shall be faced with foil reinforced *Kraft* (FRK) vapor barrier.
- D. Ductwork Insulation Accessories: Provide mechanical fasteners as recommended by the insulation manufacturer.
- E. Ductwork Insulation Compounds: Provide cement, adhesives, wire wrap, coatings, sealers, protective finishes, and similar compounds as recommended by the insulation manufacturer for the applications indicated.

2.4 MISCELLANEOUS MATERIALS:

- A. General: Provide miscellaneous materials and products of the types and sizes indicated and where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.
- B. Duct Sealant: Duct Sealant for above ground ductwork shall be a mastic suitable for the pressure classification in accordance with *SMACNA HVAC Duct Construction Standard*". All joints and seams shall be sealed.
- C. Ductwork Support Materials: Provide hot-dipped galvanized steel rods, fasteners, anchors, straps, angles, and trim for support of ductwork. Wires shall not be acceptable. Ductwork installed above a roof shall be supported on prefabricated, non-penetrating supports by *Pipe Pier* or approved equal. Provide matching adjustable elevation kits.
- D. Weatherproof Duct Sealing: Ductwork exposed outside shall be completely covered by prefabricated self-adhering, sheet-type protective membrane suitable for metal ductwork and thermal insulation. The outer layer shall be an embossed UV-resistant aluminum weathering surface. All longitudinal and circumferential joints shall be lapped and securely sealed. Alternatively, insulate exterior ductwork with “*Techna-Duc*” premanufactured, interlocking, insulated panel system by *PTM Manufacturing* or equal.

2.5 DUCT FABRICATION:

- A. Shop fabricate ductwork in 4', 8', 10' or 12' lengths, unless otherwise indicated or required to complete runs. Preassemble in the shop to the greatest extent possible to minimize field assembly of systems. Disassemble systems only to the extent necessary for shipping and handling. Match-mark sections for re-assembly and coordinated installation.
- B. Fabricate ductwork with joints, seams and reinforcements as required in the latest edition of *SMACNA HVAC Duct Construction Standards*, 2" static pressure rating unless otherwise noted on the drawings.
- C. Fabricate duct fittings to match adjoining ducts and to comply with duct requirements as applicable to fittings. Elbows shall be either the curved radius type or the square type with 4" single wall turning vanes. Double wall turning vanes are not allowed. Provide stacked single wall turning vanes for larger ducts. Curved radius elbows shall have a centerline radius equal to 1.5 times the duct width. Curved radius elbows with square throats shall not be acceptable.
- D. Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Where ducts are specified to lined, make allowances for the thickness of the liner. Duct sizes shown on the drawings are clear, inside dimensions.
- E. Kitchen hood exhaust ductwork, dishwasher exhaust ductwork and fume hood exhaust ductwork joints and seams shall have liquid-tight continuous external weld per *NFPA-96*.

PART 3 - EXECUTION

3.1 INSTALLATION OF DUCTWORK:

- A. General: Assemble and install ductwork in accordance with the latest edition of *SMACNA HVAC Duct Construction Standards* and with recognized industry practices which will achieve airtight noiseless systems, capable of performing each indicated service. Install each run with a minimum of joints. Align ductwork accurately at connections, and with internal and external surface smooth. Support ducts rigidly with suitable ties, braces, hangers, and anchors of the type which will hold ducts true-to-shape and prevent buckling. Hanger locations shall be coordinated with the building structure and finish conditions.
- B. Complete fabrication of work at the project as necessary to match shop fabricated work and accommodate installation requirements.
- C. Locate ductwork runs, except as otherwise indicated, vertically and horizontally and avoid diagonal runs wherever possible. Locate runs as indicated by plans, diagrams, details, and notations or, if not otherwise indicated, run ductwork in the shortest route which does not obstruct usable space or block access for servicing the building and its equipment. Coordinate the layout with piping, lighting layouts and similar finished work and plumbing risers. Duct layouts shown are diagrammatic and actual location of duct shall be field verified and coordinated by the duct fabricator prior to beginning fabrication of duct systems.
- D. Duct collars shall be provided where ducts pass through walls and partitions which extend full height to the underside of the roof structure. Collars shall be fabricated from 22-gauge

galvanized steel sheet. Duct collars shall be provided on both sides of walls and partitions, except collar shall be omitted on that side of the wall where registers and grilles are installed. Flanges shall be installed tight against the wall. The space between the duct and the wall shall be packed with mineral wool.

- E. Coordinate duct installations with installation of accessories, dampers, equipment, controls, and other associated work of the ductwork system.

3.2 INSTALLATION OF INSULATION:

- A. Duct Wrap: Wrap shall be wrapped around duct work with all circumferential joints butted and longitudinal joints overlapped a minimum of 2". On circumferential joints, the 2" flange on the facing shall be taped with minimum of 3" wide foil reinforced *Kraft* tape. On longitudinal joints the overlap shall be stapled on 6" centers or held in place with four evenly spaced 8" long tape tabs, then the full joint shall be taped with a minimum 3" wide foil reinforced *Kraft* tape. On ends of insulation use 3" wide foil reinforced *Kraft* tape to fasten insulation ends to duct. For duct widths 24" and greater, provide additional mechanical fasteners on 18" centers on the bottom of the duct to prevent sagging. Insulate that part of the supply diffusers above the ceiling so that there is no uncovered metal surface subject to condensation. Provide taped-on 12"x12" squares of insulation over damper regulators located above ceilings. In lieu of foil reinforced tape listed above for vapor barrier sealing, alternative glass fabric and mastic may be used. All duct insulation installed on duct exterior to building envelope shall have joints and seams taped and covered with mastic, including connections to equipment.
- B. Duct Board: Board shall be applied using mechanical fasteners such as weld pins or stick clips on 12" centers and not less than 3" from each edge or corner of the board. Apply additional pins or clips where required to hold the insulation tightly against the duct surface. Apply round vapor seal *FRK* pressure-sensitive patches to each fastener. Apply 5" wide pressure-sensitive joint sealing tape to match jacket at all insulation edges and butt joints. All duct insulation installed on duct exterior shall have joints and seams taped and covered with mastic, including connections to equipment.

3.3 CLEANING AND PROTECTION:

- A. Clean ductwork internally, unit-by-unit as it is installed, of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of the metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.
- B. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at the time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent the entrance of dust and debris.

END OF SECTION 232110

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SECTION 232120 - DUCT AND EQUIPMENT CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 WORK REQUIRED:

- A. Work required under this section consists of providing all labor, equipment, materials and supervision necessary to perform HVAC remediation, *Quality Control Assurance (QCA)* protocols designed herein and the techniques specifically required for the removal of agents potentially deleterious to human health, removal of visible surface contaminants and the cleaning of air-side surfaces of all air intakes, air handlers, coils, dampers, terminal units, diffusers and duct systems, as specified herein, including but not limited to, all adjunct components in strict accordance with these specifications.
- B. All decontamination procedures shall be accomplished by an indoor environmental company whose personnel have specialized knowledge and expertise in the methods required for the removal and disposal of visible surface contaminants, agents potentially deleterious to human health, and bulk materials which have been contaminated by such agents.
- C. Organization will have at least one (1) "Certified Air Duct Cleaning Specialist" on staff that has passed the *National Air Duct Cleaners Association* certification exam and is verifiable with their current status.
- D. Provide Owner with a proactive *IAQ Quality Control Assurance (QCA)* program to assure remediation work is performed by a disciplined standard. The Contractor is to provide a designated person who has the training and has been given the responsibility to take necessary measures to assure compliance with *OSHA 1910.1033 Indoor Air Quality Program*.
- E. *Occupational Health and Safety Administration (OSHA)* standards must be complied with. These include but may not be limited to the *Personal Protection Program (PPP)*, the *Respiratory Protection Program (RPP) 1910.134*, the *Confined Space Program (CSP) 1910.146*, and the *Hazard Communications Program (HCP) 1910.1200*. These programs must be established. The Contractor also shall provide all necessary training and equipment required by the programs for their personnel.
- F. The Contractor shall assure that its employees have received safety equipment training, medical surveillance programs, individual health protection measures, and manufacturer's product and material safety data sheets (MSDS) required for the work described by this Contract Document.
- G. The Contractor shall maintain a copy of all current *MSDS* documentation and safety certifications at the site at all times, as well as comply with all other site documentation requirements of the *OSHA* programs and this specification.

- H. All cleaning procedures shall be accomplished by an indoor environmental company with personnel that have specialized knowledge and expertise in the methods required for the removal of such materials.
- I. *Occupational Health and Safety Administration (OSHA)* general industry standard for respiratory protection *29 CFR 1910.134* requires that a respiratory protection program be established. In order to perform remediation, employee certification and in-house *Respiratory Protection Program (RPP)* documentation must be submitted.
- J. The Contractor shall assure that its employees have received the necessary training, medical surveillance programs, safety equipment, individual health protection measures, and manufacturer's product and material safety data sheets required for the work described by this Contract Document 3.10. The term "antimicrobial coating product" used in the following specifications refers to an antimicrobial formulation developed, tested and registered for HVAC ductwork and air handler applications. The antimicrobial coating product shall be an *EPA* registered, non-toxic, water soluble solution with supporting efficacy and MSDS data. Application of the antimicrobial coating products shall be in accordance with manufacturer's minimum millage surface application rate standards for effectiveness.
- K. List of personnel and their experience and projects performed.
- L. Bids shall be considered only from firms which are regularly engaged in the environmental business with emphasis on HVAC decontamination and/or ductwork remediation.

1.3 PERFORMANCE OF WORK - BASELINE CONDITIONS QCA:

- A. Pre and Post-remediation IAQ QCA.
- B. QCA shall be limited to the areas specified herein, and the specific zone/air handling system to be remediated. No other areas shall be monitored or other tests conducted without the authorization of the Owner.
- C. Personnel performing bulk (surface) QCA must be trained in IAQ. All cultures shall be quantified and qualified for microbial content in a laboratory with a minimum staff of a Ph.D. in Mycology/Microbiology Laboratory.
- D. QCA of the existing HVAC parameters shall be done in each zone/air handling unit system area prior to any remediation work in that area.
- E. Testing shall include: (minimum):

Test protocol	Indoor (Before) (Occupied Space)	Indoor (After) (Occupied Space)	Outdoor Sample
Temperatures Dry bulb (Pre/Post Coil)	X	X	X
Temperatures Wet bulb	X	X	X
Relative Humidity (Pre/Post Coil)	X	X	X

Bulk Sample Microbial Analysis	X	X	-
NADCA Vacuum Test (Nuisance Dust Protocol)	X	X	-
Videographic Imaging and Still Photos	X	X	-
Air Flow Differential Manometer	X	X	-

- F. Contractor must be capable of conducting IAQ/HVAC video imaging and still photos to be provided both before and after mechanical remediation. Both the 'before' video tape and still photos shall be available to the Owner before remediation. IAQ/HVAC imaging is to be completed utilizing VHS video capabilities before and after remediation. Optionally, a narrated and edited tape will be provided to the Owner.
- G. Microbiological bulk sampling, when performed, shall follow nationally recognized chain of custody protocols for data gathering. Culture shall be performed to identify bacteria and fungi on appropriate media.
- H. Cultures are to be characterized to quantify and qualify microbial content. Microbiological evaluations shall include fungal and bacterial cultures.
- I. Initial air flow and differential pressure readings are to be performed by the Contractor using manometer equipment. Pressure differentials shall be measured across each coil, with filtration in place.
- J. Verification of Air Conveyance Systems (ACS) decontamination will be determined by the *NADCA* vacuum test. The weight of the debris collected by the nuisance duct protocol shall not exceed 1.0mg/100 cm².
- K. Provide Owner with QCA Report including VHS video, photographs, and report of degraded areas of HVAC system, Microbial results, and air flow and pressure differential results.
- L. All QCA requirements and procedures shall be completed for post-remediation quality analysis in accordance with the post remediation table provided in this document.
- M. In addition, the following will be required to complete the post-remediation QCA:
 - N. Provide Owner with a QCA Report including Remediation Progress Report summary, a compilation of daily progress reports of work performed, all correspondence during remediation of work performed, HVAC parameter study, bulk analysis, IAQ/HVAC video imaging, differential pressure readings, *NADCA* vacuum test results, wet and dry thickness (millage) analysis of antimicrobial coating applications, and documentation of any deficiencies.
 - O. Provide Owner with records of compliance after the completion of the remediation project. This QCA analysis is to be provided to the Owner for verification of the Contractors ability to meet performance criteria as defined by sections 6.1 to 6.3.1 of *NADCA*.

1.4 CORRECTION OF WORK:

- A. The Contractor shall re-execute any work that fails to conform to or meet requirements of the Contract, and which appears during the progress of the project, and shall remedy any defects due to faulty materials or workmanship which appear within a period of one year from the date of final acceptance of the work by the Owner. The provisions of this article apply to work completed by subcontractors as well as to work completed by employees of the Contractor.

1.5 QUALITY ASSURANCE/ QUALIFICATIONS OF BIDDER:

- A. *NADCA* standard must be followed with no modifications or deviations being allowed to provide the maximum safety for the occupants in the building.
- B. The Contractor selected should have at a minimum three years membership with the *National Air Duct Cleaners Association (NADCA)* and be able to verify three cleaning projects in which the *NADCA* standards have been used.
- C. All cleaning procedures shall be accomplished by an indoor environmental company with personnel specializing in HVAC systems. Contractor shall have knowledge and expertise in the methods required for the removal of microbiological contaminants from within an HVAC system. Qualified Contractor shall be capable of performing mechanical, electrical, plumbing and control work as necessary to accomplish this scope of work. Contractor is required to be state licensed.
- D. Contractor stipulates that their work performance has been in accordance with specifications and general techniques in regard to HEPA vacuums and the application of antimicrobial products to duct systems.
- E. Contractor must have a minimum of five years' experience in commercial ductwork decontamination. Additionally, the Contractor must have experience with air sampling techniques as outlined in this Scope of Work on a minimum facility of 75,000 square feet. This project must have been cleaned with a 4,000 to 6,000 + CFM HEPA vacuum and an application of an antimicrobial coating product to the duct system.
- F. List and give a brief description of similar work completed with locations, names, phone numbers and address of each.
- G. Bids shall be considered only from firms which are regularly engaged in HVAC maintenance and in the environmental business with emphasis on air duct decontamination.

1.6 WORK SCHEDULE:

- A. All office equipment and furniture shall be covered and protected from any dust or debris in each work area.
- B. All systems shall be back online and operating at full capacity, and all areas will be ready for occupancy no later than the time agreed upon with the facilities manager.
- C. Schedules and progress reports shall be faxed or delivered on a daily basis.

1.7 MATERIALS, EQUIPMENT AND PERSONNEL:

- A. Except as otherwise noted, the Contractor shall provide and pay for all materials, labor, tools, and equipment necessary to complete the work.
- B. The Contractor shall furnish, for approval, all samples as directed. The work shall be in accordance with approved industry sampling protocols.
- C. All material shall be new, and both workmanship and materials shall be of a high standard of quality, approved by the Owner's Representative.
- D. All workmen and subcontractors shall be skilled in their trades.

1.8 REQUIREMENTS FOR SPECIFIC MODIFICATIONS OF CLEANING AND DECONTAMINATION OF AIR HANDLERS AND ZONE DAMPERS:

- A. The Contractor shall clean all types of air conveyance systems (i.e., sheet metal ducts, masonry, etc.) so that mold, mildew, lint, hair, fungi, dirt and other foreign materials and residues are properly removed.
- B. The cleaning procedures shall be accomplished by the utilization of specialized equipment as required (i.e., high suction vacuums utilizing *HEPA* filters, high pressure washers, air compressors, duct brushes, etc.)
- C. Special attention shall be taken during cleaning to prevent high levels of micro-organisms from becoming airborne and then disseminated into occupied areas. All effluents shall be removed and disposed of by the Contractor. Cleaning shall be in accordance with *NADCA Standard*.
- D. Contractor shall, during decontamination, maintain certified respirators, safety glasses and clothing according to *OSHA Respiratory Protection Standard 29-CFR-1910.134*.

1.9 ROYALTIES AND PATENTS:

- A. The Contractor shall pay all royalties and patent fees for any material or processes which require the use of proprietary patented systems and/or methods. The Contractor also agrees to hold the Owner harmless of all such claims if such issues of intellectual property arise.

1.10 PROTECTION OF WORK, PROPERTY AND PERSONS:

- A. The Contractor shall adequately protect the Owner's property and occupants. The Contractor shall be responsible for the cost arising out of any damage or injury due to his act or neglect.

1.11 ACCESS TO WORK:

- A. The Contractor shall permit and facilitate observation of the work by the Owner and his

agents and public authorities at all times.

1.12 CHANGES IN THE WORK:

- A. The Owner may order changes in the work, the Contract Sum being adjusted accordingly. All such orders and adjustments shall be in writing. Claims by the Contractor for extra cost must be supported by accurate cost breakdowns and must be approved by the Owner before executing the IAQ work involved.
- B. Any changes to the original work order contract will be executed as agreed upon utilizing labor and material rates. These IAQ remediation personnel rates will apply to any changes to the scope of the work order.
- C. Provide all receipts to the Owner and Design Professionals for change orders, as requested.

1.13 PLAN ERRORS, OMISSIONS, AND SPECIFICATION MODIFICATIONS:

- A. Claims of Plan and/or Specification errors by the Contractor for extra cost must be supported by subject documents in error, field inspection and accurate breakdowns, and approved by the Owner before Contractor will continue with the contract work. Consequently, the Owner may order changes in the work, the Contract Sum being adjusted accordingly. All such orders and adjustments shall be in writing. All procedures from this point shall be handled as normal change orders.

1.14 CONTRACTOR RESPONSIBILITIES:

- A. CONTRACTOR IS NOT RESPONSIBLE FOR PROBLEMS RESULTING FROM PRIOR INAPPROPRIATE OR CARELESS CLEANING TECHNIQUES OF OTHERS.
- B. Ensure that any air conveyance systems' interior acoustical lining materials receive careful attention to prevent damage to airside surfaces. Any acoustical or insulating liner, interior or exterior that is cut, tooled, or damaged during any procedures shall be repaired in accordance with industry specifications
- C. Reports will be made of all motor damage, deteriorating ductwork and insulation to the Owner for inspection and decision as to remedies needed. Most repairs shall be made upon discovery to maintain progress.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 AIR HANDLERS:

- A. The Contractor shall insure that the supply and return fans/blowers relating to these air handler zones of influence are thoroughly cleaned. Areas to be cleaned shall include blowers,

fan housing, blades, vanes, shafts, baffles, and drive assemblies. All mechanical or machined components shall be maintained for corrosion by removing loose rust and scale. Protection of all HVAC parts and material shall be considered prior to applying any coating or treatment. All vanes, shafts, baffles, drive assemblies or any other moveable parts within the air handler shall be properly lubricated prior to closing and completing.

- B. All visual surface contamination deposits shall be removed according to *NADCA Standard*.
- C. All items within the air handler units that are sensitive to, or could be damaged by the cleaning process, shall be properly protected during the work.
- D. Contractor shall be equipped and staffed with qualified personnel capable of removing electric heat strips, and any mechanical or plumbing components required to access coils.
- E. Coil access is made by removing panels of the HVAC system, opening existing duct accesses, creating new duct accesses, installing doors in the HVAC system panels or complete removal of the cooling coils. All coil accesses shall be installed before and after each coil where applicable (*SMACNA* specification). These are intended for future maintenance accesses and shall be as specified.
- F. Non-toxic, non-acid based coil cleaner will also be utilized as a cleaning method for coils.
- G. The Contractor shall remove contaminants from all cooling coils. Coils shall be thoroughly cleaned on both exterior surfaces and in the interior coil bank, all non- impacted contaminants shall be removed so the air flow and heat transfer are not inhibited. Back-to-back coils must be removed to accomplish cleaning of exterior surfaces. No damage to the coil or fans shall be incurred. Coils shall be thoroughly rinsed with clean water to remove any latent residues. Coils shall be covered and protected to prevent heat transfer reduction created by overspray of any coatings.

3.2 DUCTS - ACCESS OPENINGS OPTIONS:

- A. The Contractor shall provide and install access openings in the ducts and air handlers as required for proper cleaning at various points of the duct system for physical and mechanical entry. The openings shall be provided at various points and adjacent to the in-line components (i.e., turning vanes, dampers, etc.) that tend to entrap contaminants.
- B. When already installed in the HVAC system, the Contractor shall utilize the existing access openings for remediation where possible.
- C. Access openings shall be resealed with matching gauge galvanized plates with outside frame sealed and screwed to the ductwork. Patches will have an application of mastic by an approved *UL* listed product and shall be used in accordance with *SMACNA* standards.
- D. Sheet Metal Door Option:
 - 1. The door shall be 18-gauge metal with 1/2" insulation on the inside. Door edges shall be twice turned in 1/2" over the insulation. They will have a hand-type latch designed to tightly secure them and prevent air leakage yet permit re-access at future times. Doors shall be marked for easy identification.
- E. Rigid Fiberglass Ductboard Panel Option:

1. Rigid fiberglass ductboard duct systems shall be resealed in accordance with *NAIMA* specification. Only closure techniques which comply with *UL181* or *UL181a* are suitable for fibrous glass duct system closures. Openings will be created using either a ship lap tool or the 45 degree angle protocol.
2. The Contractor shall insure that all motorized and manually operated dampers and splitter-damper positions are marked to identify the original position before commencing work to assure they are returned to the original setting after completion of the cleaning process.
3. All dampers needing repair or replacement shall be brought to the attention of the Owner.

3.3 MATERIALS, CHEMICALS AND EQUIPMENT:

- A. The Contractor shall use materials, chemicals and equipment which are specified herein and preapproved by the Owner or his representative. All sanitizers and disinfecting agents or products with an antimicrobial effect must be *EPA* registered for the specific application and usage.

3.4 ANTI-MICROBIAL TREATMENT, SANITIZERS & COATINGS:

- A. Contractors must have verification of similar projects for applying a short-term residual antimicrobial solution intended for use in HVAC systems when directed and specified by consulting building hygienists (Oxine is a registered product for this purpose).
- B. Surfaces shall have been cleaned using source removal processes prior to use of any chemical sanitizer and/or coating application. Coating will be a long-term residual EPA registered product designed for HVAC systems.
- C. Sanitizers, when used, shall be applied per manufacturer's instructions, and will be used prior to coating application. System shall be thoroughly dried out after application of sanitizers.
- D. HVAC anti-microbial coating shall be applied according to manufacturer's instructions. Coating shall be sprayed directly onto interior ductwork surface, rather than "fogged" downstream onto surfaces. A continuous film must be achieved by the coating application. Application thickness shall meet the manufacturer's recommendations.
- E. Spray fumes shall be controlled by negative air equipment and proper filtration during application, exhausting volatiles to the outside. Negative pressure should be maintained for at least a two-hour period after coating application to remove volatiles from the system. Maximum outside air must be brought in through the system for at least 48 hours after application of coating. Note: The porosity of the surface will determine the square feet per gallon coverage, which will be at a spread of 200 square feet per gallon to 400 square feet per gallon.

3.5 WORKMANSHIP:

- A. The Contractor shall use materials, chemicals and equipment which are in their original containers. No open or used containers will be allowed.
- B. The cleaning process and deposit removal shall be accomplished by personnel skilled and

trained in the specific discipline. The access, preparation and dismantling of equipment for such work shall be performed by qualified HVAC personnel.

- C. The Contractor shall exercise special care to prevent any damage to the equipment, electrical motors of systems, ceiling tiles and to the building from water and/or chemicals resulting from the cleaning process. All interior equipment, furniture, files, and material shall be adequately covered and protected as necessary to prevent damage. Any damaged fixtures, equipment or systems shall be repaired, if possible, or replaced with equal equipment at no cost to the Owner.

3.6 RESPIRATOR PROTECTION PROGRAM (RPP):

- A. *Occupational Health and Safety Administration (OSHA)* general industry standard for respiratory protection *29 CFR 1910.134* requires that a respirator protection program be established. In order to perform remediation work, an *OSHA Respiratory Protection Program (RPP) Certificate of Completion* by each remediation employee and an in-house RPP must be submitted.

3.7 CONTRACTORS RESPONSIBILITIES:

- A. The Contractor Shall:
 - 1. Be responsible for unclogging HVAC components of the herein contracted air conveyance system including coils, supply registers, dampers, turning vanes, etc., fouled by dust and other contaminants.
 - 2. Report all damaged or deteriorating ductwork and/or air handler insulation to the Owner for his inspection and decision as to remediation.
 - 3. Authorized unsupervised nights. A "Progress Report" is to be faxed or delivered to the Owner within 12 hours of work completion.

3.8 IAQ/HVAC REMEDIATION EQUIPMENT:

- A. Minimum equipment requirements are as follows:
 - 1. Indoor portable, HEPA filtered negative vacuum system at 4,000 to 6,000 cfm. HEPA filtered vacuum shall be fitted with manihelic gauges reading in "inches of water gauge" to insure proper negative pressure is maintained, thus preventing escape of debris removed during the cleaning process into the inhabited area.
 - 2. All negative vacuums shall be HEPA filtered and shall meet with all *NADCA Standard* equipment requirements.
 - 3. Efficiency of HEPA vac filtration to be a minimum of 99.97% at 0.3 microns.
 - 4. Duct brushes to vary in size from 3" to 18" and designed of light nylon bristles.
 - 5. Portable air compressor rated at 150 to 200 psi and 15 to 17 cfm.
 - 6. Pressure washer rated at 800-1500 psi.

3.9 DUCT SYSTEM REMEDIATION:

- A. The Contractor shall clean all components of air conveyance system (sheet metal ducts, rigid fiberglass duct board, flex duct, masonry, etc.). Cleaning will properly remove lint, hair, fungi, dirt and other foreign materials and residues.

- B. The cleaning procedures shall be accompanied by the use of specialized equipment, i.e., high efficiency vacuum system utilizing HEPA filters, high pressure washers, duct brushes etc., as required.
- C. Special attention shall be taken while cleaning to prevent high levels of microbial contaminants from becoming airborne and disseminated into occupied areas. All effluent shall be removed and disposed of by the Contractor.
- D. The Contractor shall, during decontamination, maintain certified respirators, safety glasses and clothing according to the *OSHA Respiratory Protection Standard 29-CFR-1910.134*.
- E. The Contractor shall be responsible for unclogging and thoroughly cleaning HVAC duct system components including reheat coils, supply registers, dampers, VAV boxes, turning vanes, etc., fouled by dust and other contaminants.
- F. The Contractor shall insure that all damper and splitter-dampers are marked to identify the original position before commencing work. All components will be returned to their original setting upon completion of the cleaning process.
- G. Manually operated dampers shall be firmly reset in their original position after cleaning.
- H. Dampers requiring repair or replacement shall be brought to the Owner's attention.

3.10 DAMPER REPAIR OR REPLACEMENT IS NOT PART OF THIS CONTRACT, BUT IS AVAILABLE AS AN OPTION:

- A. Return air ducts are to be cleaned and decontaminated if ducted returns are used in the subject HVAC systems. Open plenums above ceilings and utility chases used for return air purposes shall not be cleaned unless requested and handled as an additional work order.
- B. The Contractor shall wash all terminals, grilles, and diffusers with a non-toxic, disinfecting solution.
- C. When requested or specified, Contractor must be capable, prior to reinstalling terminals, to treat with a long-term antimicrobial product.

3.11 AIR HANDLER REMEDIATION:

- A. The Contractor shall insure the supply and return fans or blowers relating to air handler zones of influence are thoroughly cleaned. Areas cleaned shall include blowers, fan housings, blades, vanes, shaft, baffles, and drive assemblies.
- B. Any surface with contamination deposits shall be removed in the manner previously outlined.
- C. Any components or items within the air handler units that could possibly be subject to damage by the cleaning process shall be properly protected during the cleaning process, as applicable.
- D. When requested or specified Contractor must be capable of coating the interior insulation,

frame-work and metal surfaces, (excluding heat transfer components), with a long term antimicrobial coating product.

- E. The Contractor shall remove contamination from all cooling coils. Coils shall be thoroughly cleaned on all exterior surfaces, both upstream and downstream. In the interior coil bank, all non-permanent impacted contamination shall be removed in the interior coil bank permitting air flow and heat transfer. Coils shall be thoroughly rinsed to remove latent residues.
- F. Coils may be cleaned with non-toxic, non-acid cleaner if properly rinsed and flushed after cleaning.

3.12 AIR HANDLER INSULATION:

- A. When requested or specified Contractor must be capable of remediating exposed degraded insulation in air handlers and/or ductwork requiring replacement. Replacement of degraded insulation is not covered by this contract but is available as an option.

3.13 AIRSIDE SURFACE TREATMENT (OPTIONAL):

- A. If indicated in the detailed bid specifications, once modifications and cleaning have been accomplished, the Contractor shall apply an *EPA* registered antimicrobial application designed specifically for HVAC ducts to all airside surfaces of the air conveyance system(s) selected above.
- B. The antimicrobial product shall be sprayed directly onto the airside surface of the ductwork system. It shall not be sprayed from a distance of more than 30". Fumes resulting from the antimicrobial treatment shall be contained within the enclosure.

3.14 POST REMEDIATION IAQ TESTING (SEE CORRECTION OF WORK):

- A. Bioaerosol surface sampling to be performed by trained personnel. Cultures shall be quantified to identify bacteria and fungi.
- B. Cultures of surface testing to be characterized by a Microbiologist to quantify and qualify microbial content. Microbial evaluations will include bacterial and fungal protocols.
- C. An Indoor Environmental Report is to be provided with documentation to include a report of the HVAC systems which relates to air handlers and ductwork. This shall include air flow measurements before and after remediation, and documentation of any deficiencies.
- D. Final air flow and differential pressure readings are to be performed by the Contractor using manometer equipment.

3.15 WARRANTY:

- 3.16 Contractor is to issue warranty on workmanship and material for a period of one year from completion of work.

END OF SECTION 232120

SECTION 232210 - AIR DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. *Titus* is the Basis of Design manufacturer for grilles, registers, and diffusers. Equivalent equipment by *Carnes, Greenheck, Krueger, Metalaire, Nailor, Price, and Tuttle & Bailey* that meets performance, capacity, space, and other requirements of the design documents shall be acceptable.
- B. Industry Standards: Comply with *National Fire Protection Association Standard No. 90A*, as applicable to construction and installation of required devices.

1.3 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties for all items as applicable.
- B. Provide standard color selection charts for all air distribution devices. All colors shall be selected by the Design Professional during Submittal Review.

PART 2 - PRODUCTS

2.1 GRILLES, REGISTERS, AND DIFFUSERS:

- A. Ceiling Return/Exhaust Grilles: Eggcrate grilles shall be all aluminum construction with 1/2" square eggcrate louvers, 1" deep. All 1'x2', 2'x2', and 2'x4' grilles in lay-in ceilings shall be the lay-in type. All other sizes shall have a flanged frame.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Install devices as detailed on the drawings and in accordance with manufacturer's written instructions and in accordance with recognized industry practices.
- B. Coordinate with other work, including ductwork and ductwork accessories and ceiling system as necessary to interface installation of grilles and diffusers properly with other work.

- C. Ceiling mounted devices to be installed in lay-in tile ceilings shall be compatible with 2'x2' or 2'x4' T-bar grid as applicable. Refer to Architectural Reflected Ceiling Plans for exact locations of grilles, registers, and diffusers. For flush mounted devices in T-bar ceilings, special care shall be taken to install devices in the center of ceiling tiles. Sagging will not be permitted. Provide rear sheet metal angle bracing.

END OF SECTION 232210

SECTION 234320 - AIR TREATMENT SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 REFERENCED CODES & STANDARDS:

- A. The following codes and standards are referenced throughout. The edition to be used is that currently enforced by the Authority Having Jurisdiction (AHJ) or in absence of such direction that referenced by the current enforceable *IMC* code or as indicated by the contract documents, except where specifically referenced by this section of the specifications.
 1. *ASHRAE Standards 62 and 52.*
 2. *National Electric Code NFPA 70.*
 3. *UL 2998.*

1.3 QUALITY ASSURANCE:

- A. *Global Plasma Solutions* is the Basis of Design manufacturer. Equivalent name brand systems manufactured by *BioClimatic* and *Phenomenal Aire* that meets performance, capacity, space, and other requirements of the design documents shall be acceptable.
- B. A qualified representative from the manufacturer shall be available to inspect the installation of the air treatment system to ensure installation in accordance with manufacturer's recommendations.
- C. Technologies that do not address gas disassociation such as UV lights, powered particulate filters and/or polarized media filters shall not be considered. Uni-polar ion generators shall not be acceptable. "Plasma" particulate filters shall not be acceptable.
- D. Projects designed using *ASHRAE Standard 62, IAQ Procedure* shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within *ASHRAE Standard 62.1* to validate acceptable indoor air quality at the quantity of outside air scheduled with the technology submitted. The manufacturer shall provide independent test data on a previous installation performed within the last two years and in a similar application, that proves compliance to *ASHRAE 62.1* and the accuracy of the calculations.
- E. Air Treatment Systems shall have been tested by *UL* or *Intertek/ETL* to prove conformance to *UL 867-2007* including the ozone chamber testing and peak ozone test for electronic devices. Manufacturers that achieved *UL 867* prior to December 21, 2007 and have not been tested in accordance with the newest *UL 867* standard with the ozone amendment shall not be acceptable. All manufacturers shall submit their independent *UL 867* test data with ozone results to the engineer during the submittal process. All manufacturers shall submit a copy with their quotation. Contractors shall not accept any proposal without the proper ozone testing documentation.

- F. The maximum allowable ozone concentration per the *UL 867-2007* chamber test shall be 0.007 ppm. The maximum peak ozone concentration per the *UL 867-2007* peak test as measured 2” away from the electronic air cleaner output shall be no more than 0.0042 ppm. Manufacturers with ozone output exceeding these ozone values shall not be acceptable.

1.4 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties. The following information shall be included in the submittal:
1. Schedule of air treatment systems indicating unit designation and number of each type required for each unit/application.
 2. Data sheet for each type of air treatment systems and accessories furnished indicating construction, sizes, and mounting details.
 3. Performance data for each type of air treatment system furnished.
 4. Indoor Air Quality calculations using the formulas within *ASHRAE Standard 62.1* to validate acceptable indoor air quality at the quantity of outside air scheduled.
 5. Product drawings detailing all physical, electrical and control requirements.
 6. Copy of *UL 2998* test.
 7. Operating and Maintenance Data: Submit O&M data and recommended spare parts lists.

1.5 WARRANTY:

- A. Equipment shall be warranted by the manufacturer against defects in material and workmanship for a period of eighteen months after shipment or twelve months from Owner acceptance, whichever occurs first. Labor to replace equipment under warranty shall be provided by the Owner or installing contractor.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT:

- A. General: Air Treatment Systems shall be the needlepoint bipolar ionization type. Provide an air treatment system for every HVAC unit scheduled on the plans unless noted otherwise on the plans.
- B. The Bipolar Ionization system shall be capable of:
1. Effectively killing microorganisms downstream of the bi-polar ionization equipment (mold, bacteria, virus, etc.).
 2. Controlling gas phase contaminants generated from human occupants, building structure and furnishings.
 3. Reducing static space charges.
 4. Increasing the interior ion levels, both positive and negative.
 5. Self-cleaning requiring no maintenance or replacement parts (where specified).
 6. Producing the specified minimum ions/cc.
 7. When mounted to the air entering side of a cooling coil, keep the cooling coil free from pathogen and mold growth.

- C. Air Treatment Systems shall operate in a manner such that equal amounts of positive and negative ions are produced. Unipolar ion devices shall not be acceptable. Air exchange rates may vary through the full operating range of a constant volume or VAV system. The quantity of air exchange shall not be increased due to requirements of the system. The air treatment system shall not have a maximum velocity profile.
- D. Air Treatment Systems shall not require preheat protection when the relative humidity of the entering air exceeds 85%. Relative humidity from 0-100% shall not cause damage, deterioration, or dangerous conditions within the systems. Air treatment systems shall be capable of wash down duty.
- E. Dual Electrode Air Treatment Systems Up To 2,400 cfm (Basis of Design is *GPS-CI-2*):
1. Where so indicated on the plans and/or schedules, air treatment systems shall be supplied and installed. The mechanical contractor shall mount the systems and wire to the HVAC unit control power (24VAC) or EMCS low voltage power per the manufacturer's instructions or line voltage subject to power available. Each system shall be designed with a molded casing, automatic self-cleaning system, self-cleaning test button, power status LED and dry contacts to prove ion output is operating properly. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per HVAC unit is required to interface to the EMCS or the optional DDC controller. Dry contacts proving power has been applied in lieu of the ion output operating are not acceptable. Manufacturers providing multiple ion modules that have alarm status wired in parallel, and not in series, shall not be acceptable.
 2. Each system shall include the required number of electrodes and power generators sized to the HVAC unit capacity. A minimum of one electrode pair per 2,400 cfm of air flow shall be provided. Bipolar ionization tubes manufactured of glass and steel mesh shall not be acceptable due to replacement requirements, maintenance, performance output reduction over time, ozone production and corrosion.
 3. Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating. Electrodes shall be made from carbon fiber to prevent oxidation over time. Internal circuitry shall be provided to sense air flow across the electrode output. Ionization systems requiring the use of a mechanical air pressure switch to cycle the electrodes only when the fan is operating shall not be acceptable due to high failure rates and pressure sensitivity.
 4. Electrode pair shall provide a minimum of 160M ions/cc/sec as measured at 2", both positive and negative ions, in equal quantities. Devices providing less than 160M ions/cc per electrode pair shall not be acceptable.
 5. Each system shall have an automatic self-cleaning feature. Systems without a no-maintenance, automatic self-cleaning feature shall not be acceptable.
 6. Each electrode pair shall be designed with a banana style plug such that it can be field replaced, if necessary.
 7. Each system shall be provided with an inline on/off switch, universal voltage input (24VAC to 240VAC or DC), and replaceable carbon fiber emitters.
 8. Units shall be mounted in the supply fan inlet(s) and oriented in the airstream to prevent ionization cancellation. For blow-thru equipment, mount the unit downstream of the evaporator coil. Secure to the equipment with magnets.
- F. Dual Electrode Air Treatment Systems Up To 2,400 cfm (Basis of Design is *GPS-FC-24-AC*):
1. Where so indicated on the plans and/or schedules, air treatment systems shall be supplied and installed. The mechanical contractor shall mount the systems and wire to the HVAC unit control power (24VAC) or EMCS low voltage power per the manufacturer's instructions or line voltage subject to power available. Each system shall be designed with a

molded casing, automatic self-cleaning system, self-cleaning test button, power status LED and dry contacts to prove ion output is operating properly. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per HVAC unit is required to interface to the EMCS or the optional DDC controller. Dry contacts proving power has been applied in lieu of the ion output operating are not acceptable. Manufacturers providing multiple ion modules that have alarm status wired in parallel, and not in series, shall not be acceptable.

2. Each system shall include the required number of electrodes and power generators sized to the HVAC unit capacity. A minimum of one electrode pair per 2,400 cfm of air flow shall be provided. Bipolar ionization tubes manufactured of glass and steel mesh shall not be acceptable due to replacement requirements, maintenance, performance output reduction over time, ozone production and corrosion.
 3. Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating. Electrodes shall be made from carbon fiber to prevent oxidation over time. Internal circuitry shall be provided to sense air flow across the electrode output. Ionization systems requiring the use of a mechanical air pressure switch to cycle the electrodes only when the fan is operating shall not be acceptable due to high failure rates and pressure sensitivity.
 4. Electrode pair shall provide a minimum of 300M ions/cc/sec as measured at 2", both positive and negative ions, in equal quantities. Devices providing less than 300M ions/cc per electrode pair shall not be acceptable.
 5. Each system shall have an automatic self-cleaning feature. Systems without a no-maintenance, automatic self-cleaning feature shall not be acceptable.
 6. Each electrode pair shall be designed with a banana style plug such that it can be field replaced, if necessary.
 7. Each system shall be provided with an inline on/off switch, universal voltage input (24VAC to 240VAC or DC), and replaceable carbon fiber emitters.
 8. Units shall be mounted in the supply fan inlet(s) and oriented in the airstream to prevent ionization cancellation. For blow-thru equipment, mount the unit downstream of the evaporator coil. Secure to the equipment with magnets.
- G. Dual Electrode Air Treatment Systems Up To 4,800 cfm (Basis of Design is *GPS-FC-48-AC*):
1. Where so indicated on the plans and/or schedules, air treatment systems shall be supplied and installed. The mechanical contractor shall mount the systems and wire to the HVAC unit control power (24VAC) or EMCS low voltage power per the manufacturer's instructions or line voltage subject to power available. Each system shall be designed with a molded casing, automatic self-cleaning system, self-cleaning test button, power status LED and dry contacts to prove ion output is operating properly. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per HVAC unit is required to interface to the EMCS or the optional DDC controller. Dry contacts proving power has been applied in lieu of the ion output operating are not acceptable. Manufacturers providing multiple ion modules that have alarm status wired in parallel, and not in series, shall not be acceptable.
 2. Each system shall include the required number of electrodes and power generators sized to the HVAC unit capacity. A minimum of one electrode pair per 4,800 cfm of air flow shall be provided. Bipolar ionization tubes manufactured of glass and steel mesh shall not be acceptable due to replacement requirements, maintenance, performance output reduction over time, ozone production and corrosion.
 3. Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating. Electrodes shall be made from carbon fiber to prevent oxidation over time. Internal circuitry shall be provided to sense air flow across the electrode output. Ionization systems requiring the use of a mechanical air pressure switch to cycle the electrodes only

- when the fan is operating shall not be acceptable due to high failure rates and pressure sensitivity.
4. Electrode pair shall provide a minimum of 400M ions/cc/sec as measured at 2", both positive and negative ions, in equal quantities. Devices providing less than 400M ions/cc per electrode pair shall not be acceptable.
 5. Each system shall have an automatic self-cleaning feature. Systems without a no-maintenance, automatic self-cleaning feature shall not be acceptable.
 6. Each electrode pair shall be designed with a banana style plug such that it can be field replaced, if necessary.
 7. Each system shall be provided with an inline on/off switch, universal voltage input (24VAC to 240VAC or DC), and replaceable carbon fiber emitters.
 8. Units shall be mounted in the supply fan inlet(s) and oriented in the airstream to prevent ionization cancellation. For blow-thru equipment, mount the unit downstream of the evaporator coil. Secure to the equipment with magnets.
- H. Electrical Requirements: Wiring, conduit and junction boxes shall be installed within housing plenums in accordance with *NEC NFPA 70*. The contractor shall coordinate electrical requirements with system manufacturer during submittals. Where necessary, provide matching dedicated power supply transformer.
- I. Control Requirements:
1. Air Treatment Systems shall have internal short circuit protection, overload protection, and automatic fault reset circuit breakers. Systems with manual fuses shall not be allowed.
 2. Integral airflow sensing shall modulate the plasma output as the airflow varies or stops. A mechanical airflow switch shall not be acceptable to activate the Plasma device due to high failure rates and possible pressure reversal.
 3. The installing contractor shall mount and wire the systems within the HVAC units specified or as shown on the plans. The contractor shall follow all manufacturer IOM instructions during installation.
 4. All systems shall have a means to interface with an EMCS system. Dry contacts shall be provided to prove ions being produced. Systems providing indication that power is applied to the system, but not directly sensing the power at the ion output, shall not be acceptable.

PART 3 - EXECUTION

3.1 GENERAL:

- A. The Contractor shall be responsible for maintaining all Air Treatment Systems until the Owner accepts the building.
- B. Dual electrode systems (*CI-2*) shall be used for all thru-wall heat pumps (THP), ductless wall and cassette air handlers (DAH), VRF wall and cassette air handlers (VAH), wall air conditioners (WAC), wall heat pumps (WHP), split system air handlers (AH), and gas furnaces (GF). Use multiple systems as needed based on cfm.
- C. Dual electrode systems (*FC24, FC48*) shall be used for all roof air conditioners (RAC), roof heat pumps (RHP), dedicated outdoor air systems (DOAS), and energy recovery ventilators (ERV). Use multiple systems as needed based on cfm.

3.2 INSTALLATION:

- A. All equipment shall be assembled and installed in a workman like manner.
- B. Any material damaged by handling, water or moisture shall be replaced by the Contractor at no cost to the Owner.
- C. All equipment shall be protected from dust and damage daily throughout construction.

3.3 TESTING:

- A. Provide the manufacturers recommended electrical tests.

3.4 STARTUP AND TRAINING:

- A. A manufacturer's authorized representative shall provide start-up supervision and training of owner's personnel in the proper operation and maintenance of all equipment.

END OF SECTION 234320

SECTION 237210 – ENERGY RECOVERY VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION:

- A. The ventilators shall be 100% outdoor air units designed to provide a continuous supply of conditioned, filtered ventilation air.

1.3 QUALITY ASSURANCE:

- A. *Greenheck* is the Basis of Design manufacturer for ERV. Equivalent name brand equipment by *Aaon*, *Daikin*, *Mitsubishi*, *Modine*, and *Reznor* that meets performance, capacity, space and other requirements of the design documents shall be acceptable.

- B. Industry Standards:

1. Blowers shall be *AMCA Certified* for airflow.
2. Entire unit shall be *ETL Certified* per *UL 1995* and bear an *ETL* sticker.
3. Energy Wheel shall be *AHRI Certified per Standard 1060*.
4. Coils shall be *Recognized Components for ANSI/UL 1995, CAN / CSA C22.2 No 236.05*. DX and water coils shall be *AHRI Certified per standard 410-2001*.
5. Indirect gas-fired furnace shall be *ETL Certified* as a component of the unit.
6. Performance rated per *AHRI 340/360*.
7. Comply with installation requirements of *ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration*.

- C. Warranty:

1. In addition to the standard one-year warranty on all components, compressors shall bear an additional four-year manufacturer's warranty against material and design defects.
2. In addition to the standard one-year warranty on all components, energy wheel and wheel belt drive shall bear an additional four-year manufacturer's warranty against material and design defects.
3. In addition to the standard one-year warranty on all components, gas heat exchangers shall bear an additional nine-year manufacturer's warranty against material and design defects.

1.4 SUBMITTALS:

- A. Provide manufacturer's data, test reports, and product warranties as applicable.

PART 2 - PRODUCTS

2.1 SINGLE PACKAGE UNITS:

- A. Units shall be single packaged type air conditioning units specifically engineered and designed for 100% outdoor air conditioning. The unit shall use DX cooling with modulating hot gas reheat, gas heat and energy recovery to deliver conditioned, dehumidified, and filtered ventilation air. The units shall be completely factory assembled, piped, fully charged, wired for single point power supply, and tested. All controls shall be factory installed and preset to the design conditions, ready for startup.
- B. Cabinet: The cabinet shall be double wall construction with galvanized steel sheet metal panels and baked enamel finish. Internal assemblies shall be heavy gauge G90 steel. Hinged access doors shall be double wall construction with flush mounted cam latch mechanisms, safety door holders and raised compression gaskets. The roof assembly shall be weatherproof double wall construction. Cabinet insulation shall be 2" thick rigid urethane foam, minimum R 13, meeting *UL 94HF-1* flame requirements. Insulation shall provide full coverage of entire exterior to include walls, roof, unit base and doors. The unit shall have a built-in hinged door electrical control panel in a separate compartment from the airstream. The enclosure shall be rated *NEMA 4*. The unit shall have a built-in filter rack with a separate hinged access door. The outdoor air inlet shall have an extruded aluminum storm proof louver with 45-degree blades, 1/2" bird screen, and insulated, low-leakage, motorized outdoor air damper. Provide hail guards and vapor tight interior service lights. Provide a motorized recirculating air damper for 100% recirculation where indicated on the plans. Roof units shall have a positive weather-tight seal consisting of a roof curb with a continuous surface for seating on a roof curb gasket. Provide matching roof curbs suitable for the roof slope. Curbs shall extend minimum 8" above roof surface. Units shall be capable of resisting wind load specified in 239110.
- C. Supply / Exhaust Fan Sections: The supply fan and exhaust fan shall be airfoil plenum type, direct drive, mounted on a steel platform with neoprene vibration isolators. Fan shall be statically and dynamically balanced and *AMCA* certified for air and sound performance. Motors shall be heavy-duty permanently lubricated type selected to match the fan load and power supply. Fans shall be capable of continuous speed modulation and controlled by a factory installed VFD. Provide with factory installed motor shaft grounding accessory.
- D. Coils: Evaporator coils, hot gas reheat coils and condenser coils shall be 1/2" seamless copper tubes mechanically expanded with aluminum fins, galvanized steel casing and end plates with plated hardware. Coils shall be factory leak tested at minimum 400 psig air pressure in a water bath. Evaporator coils shall be minimum six rows deep with maximum air velocity of 500 fpm. Where two compressors are used as components of the unit, then the evaporator coil shall be of "interlaced" configuration. Provide a double sloped, self-draining stainless steel drain pan under the entire evaporator coil. All coils shall receive a factory-applied corrosion protection coating.
- E. Refrigeration System: The refrigerant compressor(s) shall be digital or inverter-driven hermetic scroll-type and shall be equipped with liquid line filter drier, thermostatic expansion valves (TXV)(s), manual reset high-pressure and low-pressure cutouts and all appurtenant sensors, service ports and safety devices. Compressed refrigerant system shall be fully charged with R-410A refrigerant. Each compressor shall be factory-equipped with an electric crankcase heater to boil off liquid refrigerant from the oil.

- F. Condenser Fan Section: Condenser fans shall be of the direct-driven propeller type, mounted for vertical air discharge. The motor shall be inherently protected permanently lubricated with sealed ball bearings and built-in overload protection. Condenser coil guard shall be heavy gauge welded steel with baked-on epoxy coating.
- G. Indirect Gas Heater: Shall be encased in a weather-tight metal housing with intake air vents. Metal door shall provide access to the enclosed vest plate, control circuitry, gas train, burner assembly, and exhaust blower. Heater shall have an integral combustion gas blower and be *ETL* certified for installation downstream of a cooling coil. Provide 4-pass tubular heat exchangers, constructed of type 409 stainless steel with 10-year extended warranty. Heat exchanger tubes shall be installed on the vest plate by means of swaged assembly, welded connections are not acceptable. Heat exchanger tubes shall be supported and permit expansion and contraction of the tubes. Heater control shall be highest turndown offered by the manufacturer.
- H. Energy Wheel Section: Unit energy wheel shall handle the full volume of outdoor and exhaust air without an energy wheel bypass damper(s). Energy wheel shall be of total enthalpy, rotary air-to-air type and shall be an element of a removable energy wheel cassette. The cassette shall consist of a galvanized steel framework designed to produce laminar air flow through the wheel, an energy wheel as specified and a motor and drive assembly. The cassette shall incorporate a pre-tensioned urethane drive belt or a link style belt. The wheel media shall be a polymer film matrix in a stainless steel framework and be comprised of individual segments that are removable for servicing. Non-segmented energy wheels are not acceptable. Silica gel desiccant shall be permanently bonded to the polymer film and is designed and constructed to permit cleaning and servicing. Performance criteria are to be as specified in *AHRI Standard 1060*, complying with the combined efficiency data in the submittal.
- I. Filters: Unit shall have permanent 2" aluminum mesh filters located in the outdoor air intake and shall be accessible from the exterior of the unit. Provide 2" thick pleated MERV 13 filters in the supply air stream. Provide 2" thick pleated MERV 8 filters in the exhaust air stream.
- J. Electrical: Unit shall have single point power. Provide factory-installed unit disconnect switch. Provide factory installed GFCI 120V convenience outlet with transformer powered from the line side of the disconnect switch.
- K. Controls:
1. The unit shall be constructed so that it can function as a stand-alone heating and cooling system controlled by factory-supplied controllers, thermostats, and sensors, or it can be operated as a heating and cooling system controlled by an Energy Management Control System (EMCS). The unit shall be controlled by a factory-installed microprocessor programmable controller (DDC) connected to various optional sensors.
 2. Unit shall incorporate a DDC controller with integral LCD screen that provides text readouts of status. DDC controller shall have a built-in keypad to permit operator to access read-out screens without the use of ancillary equipment, devices, or software.
 3. Supply fan and exhaust fan shall be configured for as indicated on the plans.
 4. Outside Air / Return Air damper control shall be field adjustable two-position.
 5. Dirty filter sensors shall be factory installed.
 6. Energy wheel rotation sensors shall be factory installed.
 7. Frost control shall be factory installed. Control shall be the modulating wheel type.
 8. Provide factory-installed phase monitor to detect electric supply phase loss and voltage

brown-out conditions. Upon detection of a fault, the monitor shall disconnect supply voltage to all motors.

9. Variable Frequency Drives (VFD) shall be factory installed for modulation of the supply and exhaust fans. The VFDs shall be factory-programmed for unit-specific requirements and shall not require additional field programming to operate.
10. Room thermostat shall be provided as a shipped loose item. The room thermostat shall have an LCD display to adjust the room temperature set point from within the space.
11. Provide built-in airflow measuring stations for supply air and exhaust air to continuously report airflow cfm to the EMCS.
12. Provide a BACnet interface to the EMCS in section 238310. See section 238310 for additional information.

L. Control Sequences:

1. Occupied Mode: The supply fan and exhaust fan shall run continuously, and outdoor air damper shall be open during Occupied Mode. The supply fan and exhaust fan shall start only after damper status has been proven open.
2. Unoccupied Mode: The ERV will be off and outdoor air damper will be closed.
3. The unit shall shut down and generate an alarm upon receiving an emergency shutdown signal.
4. The unit shall shut down and generate an alarm upon receiving a smoke detector signal.
5. The unit shall shut down upon activation of building fire alarm system.
6. Outdoor Air Damper Failure Alarm: Commanded open, but the status is closed.
7. Outdoor Air Damper in Hand Alarm: Commanded closed, but the status is open.
8. Internal Alarms shall be provided as follows:
 - a. Supply / Exhaust Fan Failure: Commanded on, but the status is off.
 - b. Supply / Exhaust Fan in Hand: Commanded off, but the status is on.
 - c. Supply /Exhaust Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).
 - d. Total Energy Wheel Rotation Failure: Commanded on, but the status is off.
 - e. Total Energy Wheel in Hand: Commanded off, but the status is on.
 - f. Total Energy Wheel Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).
 - g. Filter Status: The controller shall monitor the status for outdoor air filters and exhaust air filters. Filter alarms shall be provided when differential pressure exceeds a user definable limit (adj.).
 - h. Supply Air Temperature: The controller shall monitor the supply air temperature. Alarms shall be provided for High Supply Air Temp (If the supply air temperature is greater than 120 F (adj.)) and Low Supply Air Temp (If the supply air temperature is less than 40 F (adj.))
9. Cooling Mode: Cooling shall be enabled during Occupied Mode when the ambient dry bulb temperature exceeds 53 F (adj.). The cooling coil discharge air temperature shall be controlled to maintain the scheduled value. Hot gas reheat shall modulate to maintain the space temperature setpoint of 74 F (adj.). The enthalpy wheel shall run when the ambient dry bulb temperature exceeds 65 F (adj.).
10. Heating Mode: Heating shall be enabled whenever outdoor air temperature is lower than 52 F (adj.) and the fan status is on. The controller shall measure the supply air temperature and modulate the heater to maintain the space temperature setpoint of 74 F (adj.). The enthalpy wheel shall run when the ERV is in heating mode.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Installer must examine areas and conditions under which units are to be installed and notify the Contractor in writing of conditions detrimental to the proper completion of the work. Do not proceed with the work until the unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION:

- A. Install units where shown, in accordance with equipment manufacturer's written instructions and recognized industry practices, to ensure that units comply with requirements and serve intended purposes.
- B. Coordinate with other work, including structural, ductwork, piping and electrical work as necessary to interface installation of ventilation units with other work. Control wiring, conduit and devices for complete, operable systems shall be provided and installed under the Mechanical specifications.
- C. HVAC drain piping shall be schedule 40 PVC pipe with socket type fittings and solvent cement joints. Piping exposed above the roof shall receive two coats of white latex paint for UV protection. Provide non-penetrating neoprene roof pedestal pipe supports with clamps on maximum five foot spacing.

3.3 TESTING:

- A. Upon completion of installation and connection to the completed air distribution system, start up and test equipment in accordance with the manufacturer's recommendations. Operate units to demonstrate capability and compliance with requirements. Where possible, field-correct malfunctioning units, then retest to demonstrate compliance.

END OF SECTION 237210

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SECTION 239110 - MECHANICAL SOUND, VIBRATION, WIND AND SEISMIC CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The drawings and general provisions of this division of the Contract, including the General and Special Conditions and Division 01 Specifications, apply to this Section.

1.2 SCOPE OF WORK:

- A. Furnish all labor, materials, tools, and equipment and perform all work necessary to complete the installation of the mechanical sound, vibration, wind, and seismic control systems required by these specifications and as detailed on the drawings.
- B. All foundations and supports required for the installation of Division 23 equipment shall be furnished by the Division 23 Contractor unless specified otherwise.
- C. The following criteria applies to all mechanical systems and components:
 - 1. Wind Pressure Velocity: 134 MPH
 - 2. Seismic Design Category: D
 - 3. Importance Factor: 1.0
- D. Based on the criteria listed above, seismic restraints are not required.

1.3 QUALITY ASSURANCE:

- A. Codes and Standards: The installation of the mechanical systems shall be installed in accordance with the following codes and standards. All seismic restraint systems such as sway bracing, cable restraints, seismic snubbers, seismic restraints, and vibration isolators shall also meet the requirements as set forth in the following standards and codes:
 - 1. *2021 International Building Code (IBC)*
 - 2. *ASHRAE*
 - 3. *SMACNA Seismic Restraint Manual*
 - 4. *ASTM 488 Anchor Locations*
 - 5. *FEMA Standards*
- B. The mechanical sound, vibration, wind, and seismic control equipment and products shall be sized and provided by the manufacturers listed below. The manufacturer shall have tested all seismic products provided for the specific intended use and installation.
- C. *Kinetics Noise Control* is the Basis of Design manufacturer. Equivalent name brand equipment by *AeroSonics*, *Aladdin*, *IAC Acoustics*, *Mason*, *MGM Products*, *Vibration Eliminator*, *Vibro-Acoustics*, and *Vibration Mountings and Controls* that meets performance, capacity, space, and other requirements of the design documents shall be acceptable.
- D. The manufacturer and/or his representative shall select all vibration isolation products in accordance with the Vibration Isolation Schedule listed in these specifications. All products

shall provide the specified deflection as indicated based on the actual equipment weights and installation requirements of the approved equipment. The manufacturer shall provide installation instructions for all provided isolators, wind restraints and seismic restraints and bracing. Locations of vibration isolation products shall be coordinated with equipment details shown on the drawings and as specified in these specifications for maximum support locations for piping and other equipment.

E. Submittals:

1. The contractor shall submit for approval by the engineer all products intended to be used to meet the requirements of these specifications. Submittal data shall include a proposed schedule for vibration isolation products, manufacturer's data and cut sheets of the specific vibration isolation, seismic control, or sound barrier materials. The Proposed Vibration Isolation Schedule shall list all equipment specified to be isolated, the equipment weight, proposed isolator type or base type, number of isolators required, spring or isolator color, and deflection of the spring or vibration isolator based on the equipment weight.
2. The contractor shall submit wind anchorage requirements for all equipment and curbs. Anchorage calculations shall be prepared by a Design Professional registered in the state where the project will be constructed. The Design Professional shall stamp all calculations. Wind anchorage requirements shall be submitted for all roof mounted equipment. Fasteners shall be selected and detailed for curb connections to the building structure and for equipment connections to the curb. Calculations shall be based on the approved equipment for the project.
3. The contractor shall submit seismic anchorage requirements for all equipment. Anchorage calculations shall be prepared by a Design Professional registered in the state where the project will be constructed. The Design Professional shall stamp all calculations. Anchorage requirements shall be submitted for all base mounted equipment, suspended equipment, and roof mounted equipment. Seismic anchorage calculations shall include an Anchorage Schedule for the contractor's use. The Anchorage Schedule shall list the equipment, the size and quantity of fasteners, and the minimum embedment depth of anchors. Calculations may be combined for similar types of equipment provided the size and weight does not vary more than 15% and the installation manners are similar.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. All equipment shall be mounted or suspended from approved foundations and supports as specified herein or as detailed on the drawings.
- B. The vibration isolation products and systems shall have a deflection as recommended by the manufacturer but not less than the deflection indicated in the Vibration Isolation Schedule.
- C. The vibration isolation manufacturer may select and propose non-seismic type isolators, provided snubbers are furnished and installed to limit the horizontal movement of equipment. Snubbers shall be selected to resist the maximum calculated lateral force of the equipment. Calculations shall be submitted and sealed by the Design Professional certifying the snubber's selection and anchorage requirements.

2.2 ISOLATOR TYPES:

- A. Type 4 - Restrained Spring Isolators: Restrained spring isolation mounts for equipment which is subject to load variations and large external or torquing forces shall consist of large diameter laterally stable steel springs assembled into formed or welded steel housing assemblies designed to limit vertical movement of the supported equipment. Springs shall have a lateral stiffness greater than 0.8 times the rated vertical stiffness and shall be designed to provide up to 50% overload capacity. Springs shall be supported either with a neoprene cup of a metal base plate complete with a ribbed neoprene pad, minimum 0.25" thick, bonded to the base plate. Springs shall be selected to provide operating static deflections as required. Springs shall be color coded or otherwise identified to indicate load capacity. In capacities up to 5,000 lbs., springs shall be replaceable. Housing assembly shall be formed or fabricated steel members and shall consist of a top-load plate complete with adjusting and leveling bolts, vertical restraints, isolation washers and a bottom plate with non-skid noise stop pads and holes provided for anchoring to supporting structure. Housing shall be hot dipped galvanized. Provide seismic rated isolators where required. Provide seismic rated restrained spring isolators where required.

2.3 BASES AND RAILS:

- A. Type D - Roof Mounted Equipment Vibration Isolation Rails: Vibration isolation rails shall be extruded aluminum or G90 galvanized steel consisting of a lower support rail, upper support rail, steel springs located between the support rails and a continuous weatherproof seal located between the upper and lower support rails. Vibration isolation rails shall be fabricated and designed to be installed and secured on top of the equipment manufacturer's roof curb. Isolation rails shall provide continuous support for the roof-mounted equipment. Isolation rails shall be designed and engineered to provide isolation against casing radiated vibration and structure born vibration from rotating equipment. The steel springs shall consist of large diameter laterally stable steel springs that have a lateral stiffness greater than 1.0 times the rated vertical stiffness and shall be designed to provide up to 50% overload capacity. Isolation rail assemblies shall include supply and return duct block-outs as an integral part of the isolation rail assembly. Springs must be removable and adjustable without disturbing the roof while equipment is in place. Where required, isolation rails shall have seismic restraints fabricated and attached to the isolation rail assembly to resist the horizontal forces.

2.4 SEISMIC CONTROL:

- A. The mechanical systems serving the building shall be installed to meet the minimum requirements of the *International Building Code* regarding seismic protection and control. These specifications and the drawings indicate the minimum requirements and general intent. The actual requirements shall be determined by the Seismic Engineer and supplier and submitted for approval by the Design Professional.
- B. The Seismic Engineer shall be a registered Professional Engineer in the state in which the facility is constructed and whose principal area of practice is seismic engineering and related fields.

- C. All equipment installed either floor or pad mounted, suspended from the structure or roof mounted on curbs shall be restrained and anchored unless exempt as hereinafter indicated.
- D. Where pipes, ducts, conduits, or other mechanical systems cross the seismic isolation interface between two seismically isolated structures, the systems shall have flexible connections to accommodate the seismic displacement of the two structures. Flexible connectors shall be installed on one side of the interface.
- E. The following mechanical components are exempt from seismic bracing or restraints:
 - 1. All components in Seismic Design Category D, E and F, weighing 20 lbs or less when the importance factor = 1.0.
 - 2. Ducts with a cross sectional area less than 6 square feet when the Importance Factor = 1.0.
 - 3. All ducts installed 12" or less from the point of connection to the supporting structure and the top of the duct with an Importance Factor = 1.0.
 - 4. Duct system components such as terminal air boxes having flexible duct connectors on the inlet or outlet or both and weighing 20 lbs or less when the Importance Factor = 1.0.
 - 5. Duct system components such as terminal air boxes having no flexible duct connectors and weighing less than 75 lbs when the Importance Factor = 1.0. These items will be considered part of the duct system.
 - 6. Piping installed 12" or less from the point of connection to the supporting structure and the top of the pipe when the Importance Factor = 1.0.
 - 7. Equipment installed less than 4'-0" above the floor and weighing less than 400 lbs when the Importance Factor = 1.0.
 - 8. Any equipment, ductwork and piping installed in a structure when the Seismic Design Category is A or B.
 - 9. Any equipment, ductwork and piping installed in a structure when the Seismic Design Category is C and the Importance Factor = 1.0.
- F. Smoke removal systems shall have an Importance Factor of 1.5. Systems having an Importance Factor of 1.5 shall be restrained.
- G. Where systems are specified to have spring isolation hangers, the hangers shall be installed as close as possible to the supporting structure.
- H. Equipment installed on non-seismic type spring isolators shall have snubbers installed to limit the horizontal movement of the equipment in any direction.
- I. Seismic restraint cables or seismic restraint braces shall be installed on piping systems and suspended equipment. Seismic restraint cables shall be stranded steel cable provided with mounting hardware for connection to the equipment hanger rod, to the equipment housing or trapeze hangers. The stranded steel cables and hardware shall be the product of a single manufacture and shall have been tested for the intended use. Published data shall be available and submitted to identify the load limitations of the proposed restraint hardware. As a minimum the following cable sizes shall be used on piping and equipment:
 - 1. Piping 1" to 2 ½": 1/16" steel cable
 - 2. Piping 3" to 8": 3/16" steel cable
 - 3. Piping 10" and larger: 1/4" steel cable
 - 4. Equipment weighting 400 lbs or less: 3/16" steel cable
 - 5. Equipment weight 401 lbs and higher: 1/4" steel cable
- J. Anchorage of equipment to concrete floors and pads shall be in accordance with the submitted anchorage calculations.

- K. Connections of seismic restraint cable hardware shall be in accordance with the submitted anchorage calculations.
- L. Snubbers shall be installed for equipment installed on non-seismic type spring isolators.
 - 1. Type S-1 snubbers shall be welded steel angles with mounting holes and a resilient neoprene pad applied to the angle surface that faces the equipment. Snubbers shall be installed on all four (4) sides of the equipment and shall limit the horizontal movement to 1/4". A minimum of (4) snubbers will be required. Snubbers shall be attached to the floor or concrete pad with fasteners as indicated in the submitted seismic anchorage calculations.
 - 2. Type S-2 snubbers shall be multi-directional by design and consist of a base plate with a welded cylinder and a mating seismic restraint angle with guide hole to receive the seismic restraint cylinder. The seismic restraint cylinder shall have a neoprene tube around the circumference of the cylinder and provide a maximum of 1/8" horizontal movement of equipment. A minimum of (2) Type S-2 snubbers shall be installed on any (1) piece of equipment.
 - 3. Type S-3 snubbers shall be multi-directional plus vertically restrained type snubbers. Snubbers shall be fabricated of welded steel and consist of a base plate with welded vertical cylinder and a mating seismic restraint angle with guide hole to receive the vertical restraint cylinder. Additionally, the vertical restraint cylinder shall be threaded and provided with a limit bolt and washer that will limit the vertical movement as well as the horizontal movement of the equipment.

2.5 VIBRATION ISOLATION SCHEDULE FOR MECHANICAL SYSTEMS:

<u>Equipment Type</u>	<u>Isolator Type</u>	<u>Base Type</u>	<u>Deflection</u>
Roof Mounted DOAS	Type 4 Mounts	Type D	2.0"

PART 3 - EXECUTION

3.1 GENERAL:

- A. If the equipment provided is not furnished with integral structural steel supports, mounting feet, or lifting lugs, the contractor shall provide miscellaneous steel shapes as required to install or suspend the equipment and attach the vibration isolation or seismic restraints as specified herein.
- B. Support steel shall include but not be limited to rails, brackets, angles, channels, and similar components.
- C. All equipment specified to be isolated shall be installed and isolators shall be attached to the building structure or floor and the vibration isolators shall be adjusted and leveled so that the vibration isolators are performing properly.
- D. All vibration isolation products, seismic restraint products, flexible pipe connectors and sound control products shall be installed as outlined in the manufacturer's printed installation instructions.

- E. For equipment scheduled to receive external vibration isolation, all factory-installed internal vibration isolation shall be locked down.

END OF SECTION 239110

SECTION 239210 - MECHANICAL TESTING, ADJUSTING, BALANCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE:

- A. General: An independent test agency shall perform the TAB work as described herein. The agency shall have a minimum of 3 years of successful TAB experience on projects of similar size and scope. The name of the test agency and proof of satisfactory performance on 5 previous projects in the form of projects referenced shall be submitted to the Design Professional for approval within 30 days after receipt of the construction contract.
- B. Test Agency: A firm with membership in the *Associated Air Balance Council (AABC)* or certified by the *National Environmental Balancing Bureau (NEBB)* in those testing and balancing disciplines similar to those required for this project, who is not the Installer of the system to be tested and is otherwise independent of the project.
- C. Compliance: Comply with *AABC* standards or *NEBB Procedural Standards for Testing-Adjusting-Balancing of Environmental Systems* as applicable to mechanical air systems and associated equipment apparatus.
- D. Industry Standards: Comply with *ASHRAE (American Society for Heating, Refrigeration and Air Conditioning Engineers, Inc.)* recommendations pertaining to measurements, instruments, and testing, adjusting, and balancing except as otherwise indicated.
- E. Pre-Qualified TAB Agencies: Subject to compliance with requirements, engage one of the following the following certified Test and Balance Agencies:
 - 1. *Air Analysis of Atlanta*
 - 2. *Augusta Air Balance Company*
 - 3. *Air Data Macon GA*
 - 4. *Commissioning Services LLC.*
 - 5. *Georgia Balance Company*
 - 6. *Research Air Flo, Inc.*
 - 7. *TAB Services*
 - 8. *Thomas Balancing*
 - 9. *Palmetto Air & Water Balance*

1.3 SUBMITTALS:

- A. Submit name of TAB Agency for approval within 60 days after Notice to Proceed.
- B. Submit 5 copies of a certified test report signed by the TAB supervisor who performed the TAB work. Test reports shall be submitted prior to the final inspection of mechanical work.

1. Include identification and types of instruments used and their most recent calibration date with submission of final test report.
 2. In addition to Air Balance and operational data required to be submitted, the report shall include any observation of unusual noise or vibration observed and any malfunction of adjustable devices encountered during TAB work.
- C. Submit *AABC National Performance Guaranty* or *NEBB Certificate of Conformance Certification* for the project.

1.4 JOB CONDITIONS:

- A. Do not proceed with testing, adjusting and balancing work until mechanical systems are complete and operable. Do not proceed until systems are clean and free from debris, dirt, and discarded building materials.

PART 2 - PRODUCTS

2.1 PATCHING MATERIALS:

- A. Except as otherwise indicated, use the same products as used by original Installer for patching holes in insulation, ductwork and housing which may have been cut or drilled for test purposes, including access for test instruments, attaching jigs and similar purposes.

2.2 TEST INSTRUMENTS:

- A. Utilize test instruments and equipment for the TAB work required, of the type, precision and capacity as recommended in *AABC* standards or *NEBB* Procedural Standards for Testing-Adjusting-Balancing of Environmental Systems.

PART 3 - EXECUTION

3.1 SCOPE:

- A. Test, Adjust, and Balance the following:
1. Energy Recovery Ventilators
 2. Air Inlets and Outlets

3.2 GENERAL REQUIREMENTS:

- A. Perform total system balance in accordance with one of the following:
1. *AABC, AABC National Standards for Total System Balance.*
 2. *NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.*
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work and submit Report prior to the Final Observation of the project.

- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. Reports shall be certified by an *AABC* Certified Test and Balance Engineer or *NEBB* Certified Testing, Balancing, and Adjusting Supervisor experienced in performance of this Work.

3.3 EXAMINATION:

- A. Review the contract documents for appurtenances and arrangement for balancing prior to the installation of any equipment or material. These shall include gauges, test plugs, valves, air volume balancing dampers, etc. The contractor shall be responsible for providing these in the locations recommended by the TAB agency in addition to any shown on the drawings or specified. Verify that duct layout design allows the TAB agency to perform duct pitot traverses to verify system air flows.
- B. The Contractor shall notify the Design Professional of any omissions noted within 30 days of the Contractor's notice to proceed.
- C. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. All filters are clean and in place. If required, install temporary media in addition to filters.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place, accessible, operable, and open. Report observation on test report.
 - 8. All dampers and operators function smoothly from shut-off to full open.
 - 9. Air coil fins are cleaned and combed.
 - 10. Access doors are installed at specified components are accessible, are closed and duct end caps are in place.
 - 11. Air outlets are installed and connected.
 - 12. Duct system leakage is minimized.
- D. Submit field reports. Report defects and deficiencies noted during performance of services which prevent system balance.

3.4 INSTALLATION TOLERANCES:

- A. Air Systems: Set HVAC system's air flow rates within the following tolerances:
 - 1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
 - 2. Air Outlets and Inlets: Plus or minus 10 percent.
- B. Building Pressure: Ensure that installation tolerances result in each floor of the building being positively pressurized with respect to outside ambient pressure.

3.5 RECORDING AND ADJUSTING:

- A. Field Logs: Maintain written logs including:
 - 1. Running logs of events and issues.
 - 2. Discrepancies, deficient or uncompleted work by others.
 - 3. Contract interpretation requests.
 - 4. Lists of completed task.
- B. Ensure recorded data represents actual measured or observed conditions.
- C. Permanently mark setting of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- D. Mark on the drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
- E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.6 FINAL TEST AND BALANCE REPORT:

- A. The report shall be a complete record of the HVAC system performance in heating and cooling modes, including conditions of operation, items outstanding, and any deviations found during the TAB process. The final report also provides a reference of actual operating conditions for the owner and/or operations personnel. All measurements and test results that appear in the reports must be made on site and dated by the TAB technicians or test and balance engineers. Report shall contain test results, including instrumentation calibration reports, in the form recommended by the applicable standards.
- B. The report must be organized by systems and shall include the following information as a minimum:
 - 1. Title Page:
 - a. Certified company name
 - b. Company address
 - c. Company telephone number
 - d. Project identification number
 - e. Location
 - f. Project Design Professional
 - g. Project Engineer
 - h. Project Contractor
 - i. Project number
 - j. Date of report
 - k. *AABC* or *NEBB* Certification Statement
 - l. Name, signature, and certification number of *AABC*, *TBE*, or *NEBB* Qualified TAB Supervisor
 - 2. Table of Contents.
 - 3. *AABC* National Performance Guaranty or *NEBB* Certificate of Conformance

Certification.

4. Report Summary:
 - a. The summary shall include a list of items that do not meet design tolerances, with information that may be considered in resolving deficiencies.
5. Instrument List:
 - a. Type
 - b. Manufacturer
 - c. Model
 - d. Serial Number
 - e. Calibration Date
6. Test and Balance Data:
 - a. Provide test data for specific systems and equipment as required by the most recent edition of the *AABC National Standards* or *NEBB Procedural Standards for Testing Adjusting and Balancing of Environmental Systems*.

3.7 MINIMUM REQUIRED TEST DATA FOR SYSTEMS:

- A. The following test data shall be submitted for each system type in addition to what is required by the *AABC National Standards* or *NEBB Procedural Standards for Testing Adjusting and Balancing of Environmental Systems*.
- B. Energy Recovery Ventilators:
 1. Identification/ Number.
 2. Manufacturer model number and serial number.
 3. Design and actual supply fan airflow, RPM, voltage, amperage, ESP and Total SP.
 4. Supply fan sheave and belt data.
 5. Design and actual exhaust fan airflow, RPM, voltage, amperage, ESP and Total SP.
 6. Exhaust fan sheave and belt data.
 7. Cooling coil: design entering and leaving air DB/WB.
 8. Cooling coil: actual entering and leaving air DB/WB. (w/ concurrent OA temp)
 9. Heating coil: design entering and leaving air DB.
 10. Heating coil: actual entering and leaving air DB. (w/ concurrent OA temp)
 11. Enthalpy Wheel: design entering and leaving air DB/WB for OA entering, wheel leaving and exhaust entering air.
 12. Enthalpy Wheel: actual entering and leaving air DB/WB for OA entering, wheel leaving and exhaust entering air.
 13. Hot Gas reheat coil: design entering and leaving air DB/WB.
 14. Hot Gas reheat coil: actual entering and leaving air DB/WB. (w/ concurrent OA temp)
 15. Verification that air treatment device is installed and operational.
 16. Record all notes pertinent to the test.
- C. Air Distribution Tests:
 1. Air terminal number.
 2. Room number/ location.
 3. Terminal type and size.
 4. Design air flow.
 5. Actual (final) air flow.
 6. Percent of design air flow.
 7. Relative position of balancing damper.
- D. Duct Traverses:

1. System zone/ branch.
 2. Duct size.
 3. Area.
 4. Design velocity and air flow.
 5. Actual velocity and air flow.
 6. Duct static pressure.
 7. Air correction factor.
- E. Space Temperature and Humidity:
1. Temperature and relative humidity (whether controlled or not) of each conditioned space.
 2. Set point of each controlling thermostat or humidity sensing device.

3.8 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS:

- A. Prepare test reports for both fans and outlets. Obtain approved submittals and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare single-line schematic diagram of systems for the purpose of identifying HVAC components.
- C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- D. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- E. Verify that motor starters are equipped with properly sized thermal protection.
- F. Check condensate drains for proper connections and functioning.
- G. Check for proper sealing of air-handling-unit components.

3.9 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS:

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
 1. Measure total airflow.
 - a. Set outside air, return air and relief air dampers for proper position that simulates minimum outdoor air conditions.
 - b. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
 - c. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
 - d. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
 2. Measure fan static pressures as follows:
 - a. Measure static pressure directly at the fan outlet or through the flexible connection.
 - b. Measure static pressure directly at the fan inlet or through the flexible connection.
 - c. Measure static pressure across each component that makes up the air-handling system.

- d. Report any artificial loading of filters at the time static pressures are measured.
 3. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows.
 1. Measure airflow of submain and branch ducts.
 2. Adjust sub-main and branch duct volume dampers for specified airflow.
 - C. Re-measure each sub-main and branch duct after all have been adjusted.
 1. Adjust air inlets and outlets for each space to indicated airflows.
 2. Set airflow patterns of adjustable outlets for proper distribution without drafts.
 3. Measure airflow at all inlets and outlets.
 4. Adjust each inlet and outlet for specified airflow.
 - D. Re-measure each inlet and outlet after all have been adjusted.
 - E. Verify final system conditions.
 - F. Re-measure and confirm minimum outdoor air, return and relief airflows are within design. Readjust to design if necessary.
 - G. Re-measure and confirm total airflow is within design.
 - H. Re-measure all final fan operating data, rpms, volts, amps, static profile.
 - I. Mark all final settings.
 - J. Test system in economizer mode. Verify proper operation and adjust, if necessary.
 - K. Measure and record all operating data.
 - L. Record final fan-performance data.
- 3.10 AIR SYSTEM PROCEDURE:
- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities.
 - B. Make air quantity measurements in ducts by Pitot tube traverse if entire cross-sectional area of duct. Close openings after measurement with permanent manufactured plugs.
 - C. Measure air quantities at air inlets and outlets.
 - D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
 - E. Use volume control devices to regulate air quantities only to extend that adjustments do not

- create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers.
- F. Vary total system air quantities by adjustment of fan speeds by drive sheave adjustment. Provide drive changes required to place belt in mid-position at final RPM. Vary branch air quantities by damper regulation.
 - G. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions. Adjust operators on outside air dampers to ensure tight seal when shut.
 - H. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

3.11 TESTING:

- A. Tester must examine the installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned and is operable. Notify the Contractor in writing of conditions detrimental to the proper completion of the test-adjusting-balancing work. Do not proceed with the TAB work until unsatisfactory conditions have been corrected in a manner acceptable to Tester.
- B. Airflows shown on drawings are provided as a guide to achieve uniform room temperature throughout the building. Field correct as required to suite room condition. Any substantial alteration shall be called to the engineer's attention.

END OF SECTION 239210