# SPARTANBURG COMMUNITY COLLEGE

# POWERS BUILDING
# A-WING RENOVATION

## PROJECT MANUAL

STATE OF SC PROJECT NO. H59-6353-JM
CGD|PBK Project No. 26010

Craig, Gaulden and Davis | PBK Architecture
19 Washington Park
Greenville, SC 29601-3111

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**May 1, 2026**

CRAIG
GAULDEN
DAVIS PBK

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**PROJECT NUMBER:** H59-6353-JM


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# SE-310
# INVITATION FOR DESIGN-BID-BUILD CONSTRUCTION SERVICES

**AGENCY:** SCC - Spartanburg Community College

**PROJECT NAME:** Spartanburg Powers A-Wing Renovations

**PROJECT NUMBER:** H59-6353-JM **CONSTRUCTION COST RANGE:** $2,000,000 **to** $2,500,000

**PROJECT LOCATION:** Powers Building, Spartanburg, SC

**DESCRIPTION OF PROJECT/SERVICES:** *(450 character limit)*

The project consists of renovations to the Powers Building. The scope of work includes selective demolition of existing suspended ceilings, HVAC, and electrical components; minor hazardous material abatement; finish flooring repairs and partial floor replacement; replacement of suspended ceilings; new toilet partitions,fixtures, base cabinets, countertops & restroom sinks; and new mechanical and lighting systems for an area of appx. 18,000 SF.

**BID/SUBMITTAL DUE DATE:** 06/30/2026 **TIME:** 02:00 PM **NUMBER OF COPIES:** 1

**PROJECT DELIVERY METHOD:** Design-Bid-Build

**AGENCY PROJECT COORDINATOR:** David Barber

**EMAIL:** barberd@sccsc.edu **TELEPHONE:** (864) 592-4960

**DOCUMENTS OBTAINED FROM:** https://www.sccsc.edu/about/vendors/construction-solicitations/

**BID SECURITY IS REQUIRED IN AN AMOUNT NOT LESS THAN 5% OF THE BASE BID.**
**PERFORMANCE AND LABOR & MATERIAL PAYMENT BONDS:** The successful Contractor will be required to provide Performance and Labor and Material Payment Bonds, each in the amount of 100% of the Contract Price.

**DOCUMENT DEPOSIT AMOUNT:** $0.00 **IS DEPOSIT REFUNDABLE:** ○ **Yes** ○ **No** ● **N/A**

Bidders must obtain Bidding Documents/Plans from the above listed sources(s) to be listed as an official plan holder. Bidders that rely on copies obtained from any other source do so at their own risk. All written communications with official plan holders & bidders will be via email or website posting.

Agency **WILL NOT** accept Bids sent via email.

*All questions & correspondence concerning this Invitation shall be addressed to the A/E.*

**A/E NAME:** Craig Gaulden Davis | PBK **A/E CONTACT:** David L. Dixon

**EMAIL:** ddixon@cgdarch.com **TELEPHONE:** (864) 242-0761

**PRE-BID CONFERENCE:** ● **Yes** ○ **No** **MANDATORY ATTENDANCE:** ○ **Yes** ● **No**

**PRE-BID DATE:** 06/16/2026 **TIME:** 02:00 PM

**PRE-BID PLACE:** Ledbetter Building Room 106 | 103 Community College Drive, Spartanburg, SC 29303

**BID OPENING PLACE:** Ledbetter Building Room 106 | 103 Community College Drive, Spartanburg, SC 29303

**BID DELIVERY ADDRESSES:**

**HAND-DELIVERY:**

**Attn:** Sheri Johnson Bid Enclosed

Ledbetter Building Room 240. 103 Community College Drive Spartanburg SC 29303

**MAIL SERVICE:**

**Attn:** Sheri Johnson Bid Enclosed

131 Community College Drive Spartanburg SC 29303

**IS PROJECT WITHIN AGENCY CONSTRUCTION CERTIFICATION?** ○ **Yes** ● **No**

**APPROVED BY:** James R. McVey Jr. **DATE:** 06/04/2026

(OSE PROJECT MANAGER)

# South Carolina Division of Procurement Services, Office of State Engineer Version of AIA® Document A701™ – 2018

## *Instructions to Bidders*

This version of AIA Document A701™–2018 is modified by the South Carolina Division of Procurement Services, Office of State Engineer ("SCOSE"). Publication of this version of AIA Document A701–2018 does not imply the American Institute of Architects' endorsement of any modification by SCOSE. A comparative version of AIA Document A701–2018 showing additions and deletions by SCOSE is available for review on the SCOSE Web site.

Cite this document as "AIA Document A701™– 2018, Instructions to Bidders — SCOSE Version," or "AIA Document A701™–2018 — SCOSE Version."

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# South Carolina Division of Procurement Services, Office of State Engineer Version of AIA® Document A701™ – 2018

## *Instructions to Bidders*

for the following Project:
*(Name, State Project Number, location, and detailed description)*
Powers Building, A Wing Renovation
H59-6353-JM
131 Community College Drive

**THE OWNER:**
*(Name, legal status, address, and other information)*
Spartanburg Community College
131 Community College Drive
Spartanburg, South Carolina 29303

The Owner is a Governmental Body of the State of South Carolina as defined by S.C. Code Ann. § 11-35-310.

**THE ARCHITECT:**
*(Name, legal status, address, and other information)*
Craig, Gaulden and Davis, LLC
19 Washington Park
Greenville, South Carolina 29601

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

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## ARTICLE 1 DEFINITIONS

§ 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.

§ 1.1.1 Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA Document A101-2017 Standard Form of Agreement Between Owner and Contractor, SCOSE Version. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA Document A201-2017 General Conditions of the Contract for Construction, SCOSE Version.

§ 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.

§ 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.

## ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 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, has correlated the Bidder's observations with the requirements of the Proposed Contract Documents, and accepts full responsibility for any pre-bid existing conditions that would affect the Bid that could have been ascertained by a site visit. As provided in S.C. Code Ann. Reg. 19-445.2042(B), a bidder's failure to attend an advertised pre-bid conference will not excuse its responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the State;

.5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception;

.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; and

.7 the Bidder understands that it may be required to accept payment by electronic funds transfer (EFT).

### § 2.2 Certification of Independent Price Determination

§ 2.2.1 GIVING FALSE, MISLEADING, OR INCOMPLETE INFORMATION ON THIS CERTIFICATION MAY RENDER YOU SUBJECT TO PROSECUTION UNDER SC CODE OF LAWS §16-9-10 AND OTHER APPLICABLE LAWS.



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§ 2.2.2 By submitting a Bid, the Bidder certifies that:

.1 The prices in this Bid have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other bidder or competitor relating to:

.1 those prices;
.2 the intention to submit a Bid; or
.3 the methods or factors used to calculate the prices offered.

.2 The prices in this Bid have not been and will not be knowingly disclosed by the Bidder, directly or indirectly, to any other bidder or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

.3 No attempt has been made or will be made by the Bidder to induce any other concern to submit or not to submit a Bid for the purpose of restricting competition.

§ 2.2.3 Each signature on the Bid is considered to be a certification by the signatory that the signatory:

.1 Is the person in the Bidder's organization responsible for determining the prices being offered in this Bid, and that the signatory has not participated and will not participate in any action contrary to Section 2.2.2 of this certification; or

.2 Has been authorized, in writing, to act as agent for the Bidder's principals in certifying that those principals have not participated, and will not participate in any action contrary to Section 2.2.2 of this certification [As used in this subdivision, the term "principals" means the person(s) in the Bidder's organization responsible for determining the prices offered in this Bid];

.3 As an authorized agent, does certify that the principals referenced in Section 2.2.3.2 of this certification have not participated, and will not participate, in any action contrary to Section 2.2.2 of this certification; and

.4 As an agent, has not personally participated, and will not participate, in any action contrary to Section 2.2.2 of this certification.

§ 2.2.4 If the Bidder deletes or modifies Section 2.2.2.2 of this certification, the Bidder must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

**§ 2.2.5 Drug Free Workplace Certification**

By submitting a Bid, the Bidder certifies that, if awarded a contract, Bidder will comply with all applicable provisions of The Drug-free Workplace Act, S.C. Code Ann. 44-107-10, et seq.

**§ 2.2.6 Certification Regarding Debarment and Other Responsibility Matters**

§ 2.2.6.1 By submitting a Bid, Bidder certifies, to the best of its knowledge and belief, that:

.1 Bidder and/or any of its Principals-

.1 Are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any state or federal agency;

.2 Have not, within a three-year period preceding this Bid, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of bids; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

.3 Are not presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in Section 2.2.6.1.1.2 of this provision.

.2 Bidder has not, within a three-year period preceding this Bid, had one or more contracts terminated for default by any public (Federal, state, or local) entity.

.3 "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

§ 2.2.6.2 Bidder shall provide immediate written notice to the Procurement Officer if, at any time prior to contract award, Bidder learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.



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**§ 2.2.6.3** If Bidder is unable to certify the representations stated in Section 2.2.6.1, Bidder must submit a written explanation regarding its inability to make the certification. The certification will be considered in connection with a review of the Bidder's responsibility. Failure of the Bidder to furnish additional information as requested by the Procurement Officer may render the Bidder non-responsible.

**§ 2.2.6.4** Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by Section 2.2.6.1 of this provision. The knowledge and information of a Bidder is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

**§ 2.2.6.5** The certification in Section 2.2.6.1 of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Bidder knowingly or in bad faith rendered an erroneous certification, in addition to other remedies available to the State, the Procurement Officer may terminate the contract resulting from this solicitation for default.

### § 2.2.7 Ethics Certificate

By submitting a Bid, the Bidder certifies that the Bidder has and will comply with, and has not, and will not, induce a person to violate Title 8, Chapter 13 of the SC Code of Laws, as amended (Ethics Act). The following statutes require special attention: S.C. Code Ann. §8-13-700, regarding use of official position for financial gain; S.C. Code Ann. §8-13-705, regarding gifts to influence action of public official; S.C. Code Ann. §8-13-720, regarding offering money for advice or assistance of public official; S.C. Code Ann. §8-13-755 and §8-13-760, regarding restrictions on employment by former public official; S.C. Code Ann. §8-13-775, prohibiting public official with economic interests from acting on contracts; S.C. Code Ann. §8-13-790, regarding recovery of kickbacks; S.C. Code Ann. §8-13-1150, regarding statements to be filed by consultants; and S.C. Code Ann. §8-13-1342, regarding restrictions on contributions by contractor to candidate who participated in awarding of contract. The State may rescind any contract and recover all amounts expended as a result of any action taken in violation of this provision. If the contractor participates, directly or indirectly, in the evaluation or award of public contracts, including without limitation, change orders or task orders regarding a public contract, the contractor shall, if required by law to file such a statement, provide the statement required by S.C. Code Ann. §8-13-1150 to the Procurement Officer at the same time the law requires the statement to be filed.

### § 2.2.8 Restrictions Applicable To Bidders & Gifts

Violation of these restrictions may result in disqualification of your Bid, suspension or debarment, and may constitute a violation of the state Ethics Act.

**§ 2.2.8.1** After issuance of the solicitation, Bidder agrees not to discuss this procurement activity in any way with the Owner or its employees, agents or officials. All communications must be solely with the Procurement Officer. This restriction may be lifted by express written permission from the Procurement Officer. This restriction expires once a contract has been formed.

**§ 2.2.8.2** Unless otherwise approved in writing by the Procurement Officer, Bidder agrees not to give anything to the Owner, any affiliated organizations, or the employees, agents or officials of either, prior to award.

**§ 2.2.8.3** Bidder acknowledges that the policy of the State is that a governmental body should not accept or solicit a gift, directly or indirectly, from a donor if the governmental body has reason to believe the donor has or is seeking to obtain contractual or other business or financial relationships with the governmental body. SC Regulation 19-445.2165(C) broadly defines the term donor.

### § 2.2.9 Open Trade Representation

By submitting a Bid, the Bidder represents that Bidder is not currently engaged in the boycott of a person or an entity based in or doing business with a jurisdiction with whom South Carolina can enjoy open trade, as defined in S.C. Code Ann. §11-35-5300.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 Distribution

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


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§ 3.1.2 Any required deposit shall be refunded to all plan holders who return the paper Bidding Documents in good condition within ten (10) 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 Reserved**

§ 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.

§ 3.1.6 All persons obtaining Bidding Documents from the issuing office designated in the advertisement shall provide that office with Bidder's contact information to include the Bidder's name, telephone number, mailing address, and email address.

**§ 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. Failure to do so will be at the Bidder's risk. Bidder assumes responsibility for any patent ambiguity that Bidder does not bring to the Architect's attention prior to Bid Opening.

§ 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 ten (10) days prior to the date for receipt of Bids.

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

§ 3.2.4 As provided in S.C. Code Ann. Reg. 19-445.2042(B), nothing stated at the Pre-bid conference shall change the Bidding Documents unless a change is made by Addendum.

**§ 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. Where "brand name or equal" is used in the Bidding Documents, the listing description is not intended to limit or restrict competition.

**§ 3.3.2 Substitution Process**

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten (10) 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.

§ 3.3.2.4 No request to substitute materials, products, or equipment for materials, products, or equipment described in the Bidding Documents and no request for addition of a manufacturer or supplier to a list of approved manufacturers or suppliers in the Bidding Documents will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten (10) days prior to the date for receipt of Bids established in the invitation to bid.


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Any subsequent extension of the date for receipt of Bids by addendum shall not extend the date for receipt of such requests unless the addendum so specifies. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the Work of other contracts that incorporation of the proposed substitution would require, shall be included.

§ **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.

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

§ **3.4.3** Addenda will be issued at least five (5) business days before the day of the Bid Opening, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids. A business day runs from midnight to midnight and excludes weekends and state and federal holidays.

§ **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.

§ **3.4.5** When the date for receipt of Bids is to be postponed and there is insufficient time to issue an Addendum prior to the original Bid Date, the Owner will notify prospective Bidders by telephone or other appropriate means with immediate follow up with an Addendum. This Addendum will verify the postponement of the original Bid Date and establish a new Bid Date. The new Bid Date will be no earlier than the fifth (5th) business day after the date of issuance of the Addendum postponing the original Bid Date.

§ **3.4.6** If an emergency or unanticipated event interrupts normal government processes so that Bids cannot be received at the government office designated for receipt of Bids by the exact time specified in the solicitation, the time specified for receipt of Bids will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal government processes resume. In lieu of an automatic extension, an Addendum may be issued to reschedule Bid Opening. If state offices are closed in the county in which Bids are to be received at the time a pre-bid or pre-proposal conference is scheduled, an Addendum will be issued to reschedule the conference. Bidders shall visit https://www.scemd.org/closings/ for information concerning closings.

## ARTICLE 4 BIDDING PROCEDURES

**§ 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 numbers.

§ **4.1.4** Interlineations, alterations and erasures must be initialed by the signer of the Bid. Bidder shall not make stipulations or qualify his Bid in any manner not permitted on the Bid Form. An incomplete Bid or information not requested that is written on or attached to the Bid Form that could be considered a qualification of the Bid, may be cause for rejection of the Bid.

§ **4.1.5** Bid all requested Alternates. The failure of the Bidder to indicate a price for an Alternate may render the Bid non-responsive. Indicate the change to the Base Bid by entering the dollar amount and marking, as appropriate, the box for "ADD TO" or "DEDUCT FROM". If no change in the Base Bid is required, enter "ZERO" or "No Change".



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§ 4.1.6 Pursuant to S.C. Code Ann. § 11-35-3020(b)(i), as amended, Section 7 of the Bid Form sets forth a list of proposed subcontractors for which the Bidder is required to identify those subcontractors the Bidder will use to perform the work listed. Bidder must follow the instructions in the Bid Form for filling out this section of the Bid Form. Failure to properly fill out Section 7 may result in rejection of Bidder's bid as non-responsive.

§ 4.1.7 Contractors and subcontractors listed in Section 7 of the Bid Form who are required by the South Carolina Code of Laws to be licensed, must be licensed as required by law at the time of bidding.

§ 4.1.8 Each copy of the Bid shall state the legal name and legal status of the Bidder. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract.

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

**§ 4.2 Bid Security**

§ 4.2.1 If required by the invitation to bid, each Bid shall be accompanied by a bid security in an amount of not less than five percent of the Base Bid. The bid security shall be a bid bond or a certified cashier's check.

§ 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.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond and 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 Bid Bond shall:

.1 be issued by a surety company licensed to do business in South Carolina;

.2 be issued by a surety company having, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty", which company shows a financial strength rating of at least five (5) times the contract price.

.3 be enclosed in the bid envelope at the time of Bid Opening, either in paper copy or as an electronic bid bond authorization number provided on the Bid Form and issued by a firm or organization authorized by the surety to receive, authenticate and issue binding electronic bid bonds on behalf the surety.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and performance and payment 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.

§ 4.2.5 By submitting a Bid Bond via an electronic bid bond authorization number on the Bid Form and signing the Bid Form, the Bidder certifies that an electronic bid bond has been executed by a Surety meeting the standards required by the Bidding Documents and the Bidder and Surety are firmly bound unto the State of South Carolina under the conditions provided in this Section 4.2.

**§ 4.3 Submission of Bids**

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

§ 4.3.2 All 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, unless hand delivered by the Bidder, be addressed to the Owner's designated purchasing office as shown in the invitation to bid. The envelope 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, or special delivery service (UPS, Federal Express, etc.), the sealed envelope shall be labelled "SEALED BID ENCLOSED" on the face thereof. Bidders hand delivering their Bids shall deliver Bids to the place of the Bid Opening as shown in the invitation for bids. Whether or not Bidders attend the Bid Opening, they shall give their Bids to the Owner's Procurement Officer or his/her designee as shown in the invitation to bid prior to the time of the Bid Opening.

§ 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.



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§ 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. Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.3.6 The official time for receipt of Bids will be determined by reference to the clock designated by the Owner's Procurement Officer or his/her designee. The Procurement Officer conducting the Bid Opening will determine and announce that the deadline has arrived and no further Bids or bid modifications will be accepted. All Bids and bid modifications in the possession of the Procurement Officer at the time the announcement is completed will be timely, whether or not the bid envelope has been date/time stamped or otherwise marked by the Procurement Officer.

**§ 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.

## ARTICLE 5 CONSIDERATION OF BIDS

**§ 5.1 Opening of Bids**

Bids received on time will be publicly opened and read aloud. The Owner will not read aloud Bids that the Owner determines, at the time of opening, to be non-responsive.

§ 5.1.1 At Bid Opening, the Owner will announce the date and location of the posting of the Notice of Intend to Award. If the Owner determines to award the Project, the Owner will, after posting a Notice of Intend to Award, send a copy of the Notice to all Bidders.

§ 5.1.2 The Owner will send a copy of the final Bid Tabulation to all Bidders within ten (10) working days of the Bid Opening.

§ 5.1.3 If only one Bid is received, the Owner will open and consider the Bid.

**§ 5.2 Rejection of Bids**

§ 5.2.1 The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.2.2 The reasons for which the Owner will reject Bids include, but are not limited to:

.1 Failure by a Bidder to be represented at a Mandatory Pre-Bid Conference or site visit;
.2 Failure to deliver the Bid on time;
.3 Failure to comply with Bid Security requirements, except as expressly allowed by law;
.4 Listing an invalid electronic Bid Bond authorization number on the Bid Form;
.5 Failure to list qualified subcontractors as required by law;
.6 Showing any material modification(s) or exception(s) qualifying the Bid;
.7 Faxing a Bid directly to the Owner or Owner's representative; or
.8 Failure to include a properly executed Power-of-Attorney with the Bid Bond.

§ 5.2.3 The Owner may reject a Bid as nonresponsive if the prices bid are materially unbalanced between line items or sub-line items. A Bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the Bid


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will result in the lowest overall cost to the Owner even though it may be the low evaluated Bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

**§ 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 and does not exceed available funds. 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** 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.

## ARTICLE 6 POST-BID INFORMATION

**§ 6.1 Contractor's Responsibility**

Owner will make a determination of Bidder's responsibility before awarding a contract. Bidder shall provide all information and documentation requested by the Owner to support the Owner's evaluation of responsibility. Failure of Bidder to provide requested information is cause for the Owner, at its option, to determine the Bidder to be non-responsible.

**§ 6.2 Reserved**

**§ 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.

**§ 6.4 Posting of Intent To Award**

The Notice of Intent to Award will be posted at the following location:

**Room or Area of Posting:** Room 240
**Building Where Posted:** Ledbetter Building
**Address of Building:** 103 Community College Drive, Spartanburg, SC 29303
**WEB site address (if applicable):** https://www.sccsc.edu/about/vendors/construction-solicitations/
**Posting date will be announced at Bid Opening.** In addition to posting the Notice, the Owner will promptly send all responsive Bidders a copy of the Notice of Intent to Award and the final bid tabulation

**§ 6.5 Protest of Solicitation or Award**

**§ 6.5.1** If you are aggrieved in connection with the solicitation or award of a contract, you may be entitled to protest, but only as provided in S.C. Code Ann. § 11-35-4210. To protest a solicitation, you must submit a protest within fifteen (15) days of the date the applicable solicitation document is issued. To protest an award, you must (i) submit notice if your intent to protest within seven (7) business days of the date the award notice is posted, and (ii) submit your actual protest within fifteen (15) days of the date the award notice is posted. Days are calculated as provided in Section 11-35-310(13). Both protests and notices of intent to protest must be in writing and must be received by the State Engineer within the time provided. The grounds of the protest and the relief requested must be set forth with enough particularity to give notice of the issues to be decided.

**§ 6.5.2** Any protest must be addressed to the CPO, Office of State Engineer, and submitted in writing:

.1 by email to protest-ose@mmo.sc.gov,

.2 by facsimile at 803-737-0639, or

.3 by post or delivery to 1201 Main Street, Suite 600, Columbia, SC 29201.

By submitting a protest to the foregoing email address, you (and any person acting on your behalf) consent to receive communications regarding your protest (and any related protests) at the e-mail address from which you sent your protest.


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## ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

**§ 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.

**§ 7.1.3** The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the state of South Carolina.

**§ 7.1.4** Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of 100% of the Contract Sum.

**§ 7.2 Time of Delivery of Contract, Certificates of Insurance, and Form of Bonds**

**§ 7.2.1** Following expiration of the protest period, the Owner will forward the Contract for Construction to the Bidder for signature. The Bidder shall return the fully executed Contract for Construction to the Owner within seven (7) days. The Bidder shall deliver the required bonds and certificate of insurance to the Owner not later than three (3) days following the date of execution of the Contract. Failure to deliver these documents as required shall entitle the Owner to consider the Bidder's failure as a refusal to enter into a contract in accordance with the terms and conditions of the Bidder's Bid and to make claim on the Bid Security for re-procurement cost.

**§ 7.2.2** Unless otherwise provided, the bonds shall be written on the Performance Bond and Payment Bond forms included in the Bid Documents.

**§ 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.

## ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

**§ 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, SCOSE Version.

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, SCOSE Version.

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction, SCOSE Version.

.4 Drawings

| Number | Title | Date |
|---|---|---|

.5 Specifications

| Section | Title | Date | Pages |
|---|---|---|---|



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.6 Addenda:

| Number | Date | Pages |
|---|---|---|

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

☐ AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

☐ AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:

☐ The Sustainability Plan:

☐ Supplementary and other Conditions of the Contract:

.8 Other documents listed below:
*(List here any additional documents that are intended to form part of the Proposed Contract Documents.)*

**ARTICLE 9 Miscellaneous**

**§ 9.1 Nonresident Taxpayer Registration Affidavit Income Tax Withholding Important Tax Notice - Nonresidents Only**

**§ 9.1.1** Withholding Requirements for Payments to Nonresidents: SC Code of Laws §12-8-550 requires persons hiring or contracting with a nonresident conducting a business or performing personal services of a temporary nature within South Carolina to withhold 2% of each payment made to the nonresident. The withholding requirement does not apply to (1) payments on purchase orders for tangible personal property when the payments are not accompanied by services to be performed in South Carolina, (2) nonresidents who are not conducting business in South Carolina, (3) nonresidents for contracts that do not exceed $10,000 in a calendar year, or (4) payments to a nonresident who (a) registers with either the S.C. Department of Revenue or the S.C. Secretary of State and (b) submits a Nonresident Taxpayer Registration Affidavit - Income Tax Withholding, Form I-312 to the person letting the contract.

**§ 9.1.2** For information about other withholding requirements (e.g., employee withholding), contact the Withholding Section at the South Carolina Department of Revenue at 803-898-5383 or visit the Department's website at: www.sctax.org

**§ 9.1.3** This notice is for informational purposes only. This Owner does not administer and has no authority over tax issues. All registration questions should be directed to the License and Registration Section at 803-898-5872 or to the South Carolina Department of Revenue, Registration Unit, Columbia, S.C. 29214-0140. All withholding questions should be directed to the Withholding Section at 803-898-5383.

PLEASE SEE THE "NONRESIDENT TAXPAYER REGISTRATION AFFIDAVIT INCOME TAX WITHHOLDING" FORM (Available through SC Department of Revenue).


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**§ 9.2 Submitting Confidential Information**

**§ 9.2.1** For every document the Bidder submits in response to or with regard to this solicitation or request, the Bidder must separately mark with the word "CONFIDENTIAL" every page, or portion thereof, that the Bidder contends contains information that is exempt from public disclosure because it is either (a) a trade secret as defined in Section 30-4-40(a)(1), or (b) privileged & confidential, as that phrase is used in SC Code of Laws §11-35-410.

**§ 9.2.2** For every document the Bidder submits in response to or with regard to this solicitation or request, the Bidder must separately mark with the words "TRADE SECRET" every page, or portion thereof, that the Bidder contends contains a trade secret as that term is defined by SC Code of Laws §39-8-20.

**§ 9.2.3** For every document the Bidder submits in response to or with regard to this solicitation or request, the Bidder must separately mark with the word "PROTECTED" every page, or portion thereof, that the Bidder contends is protected by SC Code of Laws §11-35-1810.

**§ 9.2.4** All markings must be conspicuous; use color, bold, underlining, or some other method in order to conspicuously distinguish the mark from the other text. Do not mark your entire Bid as confidential, trade secret, or protected! If your Bid, or any part thereof, is improperly marked as confidential or trade secret or protected, the State may, in its sole discretion, determine it nonresponsive. If only portions of a page are subject to some protection, do not mark the entire page.

**§ 9.2.5** By submitting a response to this solicitation, Bidder (1) agrees to the public disclosure of every page of every document regarding this solicitation or request that was submitted at any time prior to entering into a contract (including, but not limited to, documents contained in a response, documents submitted to clarify a response, & documents submitted during negotiations), unless the page is conspicuously marked "TRADE SECRET" or "CONFIDENTIAL" or "PROTECTED", (2) agrees that any information not marked, as required by these bidding instructions, as a "Trade Secret" is not a trade secret as defined by the Trade Secrets Act, & (3) agrees that, notwithstanding any claims or markings otherwise, any prices, commissions, discounts, or other financial figures used to determine the award, as well as the final contract amount, are subject to public disclosure.

**§ 9.2.6** In determining whether to release documents, the State will detrimentally rely on the Bidders' marking of documents, as required by these bidding instructions, as being either "Confidential" or "Trade Secret" or "PROTECTED".

**§ 9.2.7** By submitting a response, the Bidder agrees to defend, indemnify & hold harmless the State of South Carolina, its officers & employees, from every claim, demand, loss, expense, cost, damage or injury, including attorney's fees, arising out of or resulting from the State withholding information that Bidder marked as "confidential" or "trade secret" or "PROTECTED".

**§ 9.3 Solicitation Information From Sources Other Than Official Source**

South Carolina Business Opportunities (SCBO) is the official state government publication for State of South Carolina solicitations. Any information on State agency solicitations obtained from any other source is unofficial and any reliance placed on such information is at the Bidder's sole risk and is without recourse under the South Carolina Consolidated Procurement Code.

**§ 9.4 Builder's Risk Insurance**

Bidders are directed to Exhibit A of the AIA Document A101, 2017 SCOSE Version, which, unless provided otherwise in the Bid Documents, requires the contractor to provide builder's risk insurance on the project.

**§ 9.5 Reserved**

**§ 9.6 Other Special Conditions Of The Work**



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# AIA Document A310 – Bid Bond

## The bid bond must be in the form of AIA Document A310 2010 Edition

# SE-330
# LUMP SUM BID FORM

***Bidders shall submit bids on only Bid Form SE-330.***

---

**BID SUBMITTED BY:** _____

*(Bidder's Name)*

**BID SUBMITTED TO:** Spartanburg Community College

*(Agency's Name)*

**FOR: PROJECT NAME:** Powers Building A-Wing

**PROJECT NUMBER:** H59-9353-JM

## OFFER

**§ 1.** In response to the Invitation for Construction Services and in compliance with the Instructions to Bidders for the above-named Project, the undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with the Agency on the terms included in the Bidding Documents, and to perform all Work as specified or indicated in the Bidding Documents, for the prices and within the time frames indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

**§ 2.** Pursuant to SC Code § 11-35-3030(1), Bidder has submitted Bid Security in the amount and form required by the Bidding Documents.

**§ 3.** Bidder acknowledges the receipt of the following Addenda to the Bidding Documents and has incorporated the effects of said Addenda into this Bid:

*(Bidder, check all that apply. Note, there may be more boxes than actual addenda. Do not check boxes that do not apply)*

**ADDENDA:** ☐ **#1** ☐ **#2** ☐ **#3** ☐ **#4** ☐ **#5**

**§ 4.** Bidder accepts all terms and conditions of the Invitation for Bids, including, without limitation, those dealing with the disposition of Bid Security. Bidder agrees that this Bid, including all Bid Alternates, if any, may not be revoked or withdrawn after the opening of bids, and shall remain open for acceptance for a period of **60** Days following the Bid Date, or for such longer period of time that Bidder may agree to in writing upon request of the Agency.

**§ 5.** Bidder herewith offers to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fees, permits, licenses and applicable taxes necessary to complete the following items of construction work:

**§ 6.1 BASE BID WORK** ***(as indicated in the Bidding Documents and generally described as follows)*****:** Level 1 interior renovations to the A Wing portion of the Powers Academic Building, including interior finishes, new HVAC and electrical systems, new ceilings and restroom modifications.

**$** _____, which sum is hereafter called the Base Bid.

***(Bidder to insert Base Bid Amount on line above)***

# SE-330
# LUMP SUM BID FORM

## § 7. LISTING OF PROPOSED SUBCONTRACTORS PURSUANT TO SECTION 3020(b)(i), CHAPTER 35, TITLE 11 OF THE SOUTH CAROLINA CODE OF LAWS, AS AMENDED

*(See Instructions on page BF-2A)*

Bidder shall use the below-listed Subcontractors in the performance of the Subcontractor Classification work listed:

| (A) LICENSE CLASSIFICATION or SUBCLASSIFICATION ABBREVIATION per SCLLR *(Completed by Agency)* | (B) NAME of SUBCONTRACTOR and/or PRIME CONTRACTOR *(Completed by Bidder)* | (C) SUBCONTRACTOR'S and/or PRIME CONTRACTOR'S SC LICENSE NUMBER *(Completed by Bidder)* |
|---|---|---|
| **BASE BID** | | |
| HT | | |
| AC | | |
| EL | | |
| PB | | |
| **ALTERNATE #1** | | |
| | | |
| | | |
| | | |
| | | |
| **ALTERNATE #2** | | |
| | | |
| | | |
| | | |
| | | |
| **ALTERNATE #3** | | |
| | | |
| | | |
| | | |
| | | |

# SE-330
# LUMP SUM BID FORM

## INSTRUCTIONS FOR SUBCONTRACTOR LISTING

1. Section 7 of the Bid Form sets forth an Agency-developed list of subcontractor license classifications or subclassifications for which Bidder is required to identify the entity (subcontractor(s) and/or prime) Bidder will use to perform this work.
   a. **Column A**: The Agency enters the appropriate SCLLR abbreviation to identify the subcontractor license classification / subclassification for which the Bidder is required to list either a subcontractor or itself as the entity that will perform the work. Abbreviations of licenses can be found at:
   https://llr.sc.gov/clb/PDFFiles/CLBClassificationAbbreviations.pdf. If the Agnecy has not identified a subcontractor license classification/subclassification, the Bidder does not list a subcontractor.
   b. **Columns B and C:** The Bidder identifies the subcontractors, by name and license number, it will use for the work of each license listed by the Agency in Column A. Bidder must identify only the subcontractor(s) who will perform the work and no others. Bidders must make sure that their identification of each subcontractor is clear and unambiguous. A listing that could be any number of different entities may be cause for rejection of the bid as non-responsive. For example, a listing of M&M without additional information may be problematic if there are multiple different licensed contractors in South Carolina whose names start with M&M.
2. **Subcontractor Defined:** For purposes of subcontractor listing, a subcontractor is an entity who will perform work or render service to the prime contractor to or about the construction site pursuant to a contract with the prime contractor. Bidder should not identify sub-subcontractors in the spaces provided on the bid form but only those entities with which Bidder will contract directly. Do not identify material suppliers, manufacturers, and fabricators that will not perform physical work at the site of the project but will only supply materials or equipment to the Bidder or proposed subcontractor(s).
3. **Subcontractor Qualifications:** Bidder must only list subcontractors who possess a South Carolina contractor's license that includes the license classification and/or subclassification identified by the Agency in Column A. The subcontractor license must also be within the appropriate license group for the work (do not list the Group number). If Bidder lists a subcontractor who is not qualified to perform the work, the Bidder will be rejected as non-responsible.
4. **Use of Own forces:** If, under the terms of the Bidding Documents and SC Contractor Licensing laws, Bidder is qualified to perform the work of a listed subcontractor classification or subclassification and Bidder does not intend to subcontract such work but to use Bidder's own employees to perform such work, the Bidder must insert itself in the space provided.
5. **Use of Multiple Subcontractors:**
   a. If Bidder intends to use multiple subcontractors to perform the work of a single license classification/subclassification, Bidder must insert the name of each subcontractor Bidder will use, preferably separating the name of each by the word **"and"**. If Bidder intends to use both his own employees to perform a part of the work of a single license classification/subclassification and to use one or more subcontractors to perform the remaining work, Bidder must insert itself and each subcontractor, preferably separating them with the word **"and"**. Bidder must use each entity listed for the work of a single license classification/subclassification in the performance of that work.
   b. **Optional Listing Prohibited:** Bidder may not list multiple subcontractors for a license classification/subclassification in a form that provides the Bidder the option, after bid opening or award, to choose one or more but not all the listed subcontractors to perform the work for which they are listed. A listing, which on its face requires subsequent explanation to determine whether it is an optional listing, is non-responsive. If Bidder intends to use multiple entities to perform the work for a single listing, Bidder must clearly set forth on the bid form such intent. Bidder may accomplish this by simply inserting the word "**and**" between the names of each entity listed. Agency will reject as non-responsive a listing that contains the names of multiple subcontractors separated by a blank space, the word "or", a virgule (that is a /), or any separator that the Agency may reasonably interpret as an optional listing.
6. If Bidder is awarded the contract, Bidder will not be allowed to substitute another entity as subcontractor in place of a subcontractor listed in Section 7 of the Bid except for one or more of the reasons allowed by the SC Code of Laws.
7. Bidder's failure to identify an entity (subcontractor or itself) to perform the work of a subcontractor listed in Column A will render the Bid non-responsive.

# SE-330
# LUMP SUM BID FORM

## § 8. LIST OF MANUFACTURERS, MATERIAL SUPPLIERS, AND SUBCONTRACTORS OTHER THAN SUBCONTRACTORS LISTED IN SECTION 7 ABOVE *(FOR INFORMATION ONLY):*

Pursuant to instructions in the Invitation for Construction Services, if any, Bidder will provide to Agency upon the Agency's request and within 24 hours of such request, a listing of manufacturers, material suppliers, and subcontractors, other than those listed in Section 7 above, that Bidder intends to use on the project. Bidder acknowledges and agrees that this list is provided for purposes of determining responsibility and not pursuant to the subcontractor listing requirements of SC Code § 11-35-3020(b)(i).

## § 9. TIME OF CONTRACT PERFORMANCE AND LIQUIDATED DAMAGES

**a) CONTRACT TIME**

Bidder agrees that the Date of Commencement of the Work shall be established in a Notice to Proceed to be issued by the Agency. Bidder agrees to substantially complete the Work within **120** Calendar Days from the Date of Commencement, subject to adjustments as provided in the Contract Documents.

**b) LIQUIDATED DAMAGES**

Bidder further agrees that from the compensation to be paid, the Agency shall retain as Liquidated Damages the amount of $**750.00** for each Calendar Day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted time for Substantial Completion as provided in the Contract Documents. This amount is intended by the parties as the predetermined measure of compensation for actual damages, not as a penalty for nonperformance.

## § 10. AGREEMENTS

**a)** Bidder agrees that this bid is subject to the requirements of the laws of the State of South Carolina.

**b)** Bidder agrees that at any time prior to the issuance of the Notice to Proceed for this Project, this Project may be canceled for the convenience of, and without cost to, the State.

**c)** Bidder agrees that neither the State of South Carolina nor any of its agencies, employees or agents shall be responsible for any bid preparation costs, or any costs or charges of any type, should all bids be rejected or the Project canceled for any reason prior to the issuance of the Notice to Proceed.

## § 11. ELECTRONIC BID BOND

By signing below, the Principal is affirming that the identified electronic bid bond has been executed and that the Principal and Surety are firmly bound unto the State of South Carolina under the terms and conditions of the AIA Document A310, Bid Bond, referenced in the Bidding Documents.

**ELECTRONIC BID BOND NUMBER:** _____

**SIGNATURE AND TITLE:** _____

# SE-330
# LUMP SUM BID FORM

**CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATION**

**SC Contractor's License Number(s):** _____

**Classification(s) & Limits:** _____

**Subclassification(s) & Limits:** _____

**By signing this Bid, the person signing reaffirms all representation and certification made by both the person signing and the Bidder, including without limitation, those appearing in Article 2 of the SCOSE Version of the AIA Document A701, Instructions to Bidders, is expressly incorporated by reference.**

**BIDDER'S LEGAL NAME:** _____

**ADDRESS:** _____

_____

**TELEPHONE:** _____

**EMAIL:** _____

**SIGNATURE:** _____ **DATE:** _____

**PRINT NAME:** _____

**TITLE:** _____

# South Carolina Division of Procurement Services, Office of State Engineer Version of AIA® Document A101® – 2017

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

This version of AIA Document A101®–2017 is modified by the South Carolina Division of Procurement Services, Office of State Engineer ("SCOSE"). Publication of this version of AIA Document A101–2017 does not imply the American Institute of Architects' endorsement of any modification by SCOSE. A comparative version of AIA Document A101–2017 showing additions and deletions by SCOSE is available for review on the SCOSE Web site.

Cite this document as "AIA Document A101®–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum — SCOSE Version," or "AIA Document A101®–2017 — SCOSE Version."

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# South Carolina Division of Procurement Services, Office of State Engineer Version of 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)*

Spartanburg Community College
131 Community College Drive
Spartanburg, South Carolina 29303

The Owner is a Governmental Body of the State of South Carolina as defined in S.C. Code Ann. § 11-35-310.

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

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

Powers Building, A Wing Renovation
State of SC Project No. H59-6353-JM

115 Community College Drive | Spartanburg, South Carolina 29303

The project consists of a final phase of renovations to the Powers Building, an academic classroom. The scope of work includes selective demolition of suspended ceilings, HVAC, and electrical components; minor hazardous material abatement; flooring repairs and partial replacement; replacement of suspended ceilings; new toilet partitions and floor tile; new mechanical and lighting systems for an area of approximately 18,000 square feet.

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

Craig, Gaulden and Davis, LLC | PBK Architecture
19 Washington Park
Greenville, South Carolina 29601

The Owner and Contractor agree as follows.

This version of AIA Document A101–2017 is modified by the South Carolina Division of Procurement Services, Office of State Engineer. Publication of this version of AIA Document A101 does not imply the American Institute of Architects' endorsement of any modification by South Carolina Division of Procurement Services, Office of State Engineer. A comparative version of AIA Document A101–2017 showing additions and deletions by the South Carolina Division of Procurement Services, Office of State Engineer is available for review on South Carolina state Web site.

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

Init.
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EXHIBIT A INSURANCE AND BONDS

## ARTICLE 1 THE CONTRACT DOCUMENTS

**§ 1.1** 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.

**§ 1.2** Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101-2017 Standard Form of Agreement Between Owner and Contractor, SCOSE Version. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201-2017 General Conditions of the Contract for Construction, SCOSE Version.

## ARTICLE 2 THE WORK OF THIS CONTRACT

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

## ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

**§ 3.1** The Date of Commencement of the Work shall be the date fixed in a Notice to Proceed issued by the Owner. The Owner shall issue the Notice to Proceed to the Contractor in writing, no less than seven (7) days prior to the Date of Commencement. Unless otherwise provided elsewhere in the Contract Documents and provided the Contractor has secured all required insurance and surety bonds, the Contractor may commence work immediately after receipt of the Notice to Proceed.

**§ 3.2** The Contract Time as provided in the Notice to Proceed for this project shall be measured from the Date of Commencement of the Work to Substantial Completion.

### § 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 within the Contract Time indicated in the Notice to Proceed.

**§ 3.3.2** 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.



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## ARTICLE 4 CONTRACT SUM

**§ 4.1** The Owner shall pay the Contractor the Contract Sum, including all accepted alternates indicated in the bid documents, 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 that are accepted, if any, included in the Contract Sum:
*(Insert the accepted Alternates.)*

| Item | Price |
|---|---|

**§ 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**

**§ 4.5.1** Contractor agrees that from the compensation to be paid, the Owner shall retain as liquidated damages the amount indicated in Section 9(b) of the Bid Form for each calendar day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted time for Substantial Completion as provided in the Contract Documents. The liquidated damages amount is intended by the parties as the predetermined measure of compensation for actual damages, not as a penalty.

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


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## ARTICLE 5 PAYMENTS

### § 5.1 Progress Payments

**§ 5.1.1** Based upon Applications for Payment submitted to the Architect and Owner 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** The Owner shall make payment of the certified amount to the Contractor not later than twenty-one (21) days after receipt of the Application for Payment.

**§ 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** Subject to S.C. Code Ann. § 12-8-550 (Withholding Requirements for Payments to Non-Residents), 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 three and one-half percent (3.5%), as retainage, from the payment otherwise due.

**§ 5.1.7.2** When a portion, or division, of Work as listed in the Schedule of Values is 100% complete, that portion of the retained funds which is allocable to the completed division must be released to the Contractor. No later than ten (10) days after receipt of retained funds from the Owner, the Contractor shall pay to the subcontractor responsible for such completed work the full amount of retainage allocable to the subcontractor's work.

**§ 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.


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**§ 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 twenty-one (21) days after the issuance of the Architect's final Certificate for Payment.

## ARTICLE 6 DISPUTE RESOLUTION

**§ 6.1** Claims and disputes shall be resolved in accordance with Article 15 of AIA Document A201–2017.

## ARTICLE 7 TERMINATION OR SUSPENSION

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

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

## ARTICLE 8 MISCELLANEOUS PROVISIONS

**§ 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:

**§ 8.2.1** The Owner designates the individual listed below as its Senior Representative ("Owner's Senior Representative"), which individual has the responsibility for and, subject to Section 7.2.1 of the General Conditions, the authority to resolve disputes under Section 15.6 of the General Conditions:

**Name:** Ethan Burroughs
**Title:** Vice President of Economic & Operations Development
**Address:** 131 Community College Dr, Spartanburg, SC 29303
**Telephone:** 864-592-4614
**Email:** burroughse@sccsc.edu

**§ 8.2.2** The Owner designates the individual listed below as its Owner's Representative, which individual has the authority and responsibility set forth in Section 2.1.1 of the General Conditions:

**Name:** David Barber
**Title:** Project Manager / Campus Operations
**Address:** 131 Community College Dr, Spartanburg, SC 29303
**Telephone:** 864-592-4960
**Email:** barberd@sccsc.edu

**§ 8.3** The Contractor's representative:

**§ 8.3.1** The Contractor designates the individual listed below as its Senior Representative ("Contractor's Senior Representative"), which individual has the responsibility for and authority to resolve disputes under Section 15.6 of the General Conditions:

**Name:**



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**Title:**
**Address:**
**Telephone:**
**Email:**

**§ 8.3.2** The Contractor designates the individual listed below as its Contractor's Representative, which individual has the authority and responsibility set forth in Section 3.1.1 of the General Conditions:

**Name:**
**Title:**
**Address:**
**Telephone:**
**Email:**

**§ 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** The Architect's representative:

| | |
|---|---|
| **Name:** | David Dixon |
| **Title:** | Senior Principal |
| **Address:** | 19 Washington Park; Greenville, SC 29601 |
| **Telephone:** | 864-242-0761 |
| **Email:** | ddixon@cgdarch.com |

**§ 8.6 Insurance and Bonds**

**§ 8.6.1** 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.

**§ 8.6.2** The Contractor shall provide bonds as set forth in AIA Document A101®–2017 Exhibit A, and elsewhere in the Contract Documents.

**§ 8.7** 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.)*

**§ 8.8 Other Provisions:**

**§ 8.8.1** Additional requirements, if any, for the Contractor's Construction Schedule are as follows:
*(Check box if applicable to this Contract)*
[X] The Construction Schedule shall be in a detailed precedence-style critical path management (CPM) or primavera-type format satisfactory to the Owner and the Architect that shall also (1) provide a graphic representation of all activities and events that will occur during performance of the Work; (2) identify each phase of construction and occupancy; and (3) set forth milestone dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents.

.1 Upon review by the Owner and the Architect for conformance with milestone dates and Construction Time given in the Bidding Documents, with associated Substantial Completion date, the Construction Schedule shall be deemed part of the Contract Documents and attached to the Agreement as an Exhibit. If returned for non-conformance, the Construction Schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Architect and resubmitted.


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.2 The Contactor shall monitor the progress of the Work for conformance with the requirements of the Construction Schedule and shall promptly advise the Owner of any delays or potential delays. Whenever the Construction Schedule no longer reflects actual conditions and progress of the Work or the Contract Time is modified in accordance with the terms of the Contract Documents, the Contractor shall update the Construction Schedule to reflect such conditions.

.3 In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary.

.4 In no event shall any progress report constitute an adjustment in the Contract Time, any milestone date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

**§ 8.8.2** The Owner's review of the Contractor's schedule is not conducted for the purpose of either determining its accuracy, completeness, or approving the construction means, methods, techniques, sequences or procedures. The Owner's review shall not relieve the Contractor of any obligations.

## ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

**§ 9.1** This Agreement is comprised of the following documents:

.1 AIA Document A101®–2017, SCOSE Version Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A101®–2017, Exhibit A, Insurance and Bonds

.3 AIA Document A201®–2017, SCOSE Version General Conditions of the Contract for Construction

.4 Form SE-390, Notice to Proceed – Construction Contract

.5 Drawings

| Number | Title | Date |
|---|---|---|

.6 Specifications

| Section | Title | Date | Pages |
|---|---|---|---|

.7 Addenda, if any:

| Number | Date | Pages |
|---|---|---|

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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.)*

**Form SE-310, Invitation for Construction Services**
**Instructions to Bidders (AIA Document A701-2018 OSE Version)**
**Form SE-330, Contractor's Bid (Completed Bid Form)**
**Form SE-370, Notice of Intent to Award**
**Certificate of Procurement Authority issued by the State Fiscal Accountability Authority**


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

| | |
|---|---|
| **OWNER** *(Signature)* | **CONTRACTOR** *(Signature)* |
| *(Printed name and title)* | *(Printed name and title)* |

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# South Carolina Division of Procurement Services, Office of State Engineer Version of AIA® Document A201® – 2017

## *General Conditions of the Contract for Construction*

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# South Carolina Division of Procurement Services, Office of State Engineer Version of AIA® Document A201® – 2017

## *General Conditions of the Contract for Construction*

**for the following PROJECT:**
*(Name, State Project Number, and location or address)*

Powers Building, A Wing Renovation
H59-6353-JM
131 Community College Drive

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

Spartanburg Community College
131 Community College Drive
Spartanburg, South Carolina 29303

The Owner is a Governmental Body of the State of South Carolina as defined in S.C. Code Ann.§ 11-35-310.

**THE ARCHITECT:**
*(Name, legal status, and address)*

Craig, Gaulden and Davis, LLC
19 Washington Park
Greenville, South Carolina 29601

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

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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

### § 1.1.1 The Contract Documents

.1 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.

.2 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.

.3 Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

.4 Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101-2017, Standard Form of Agreement Between Owner and Contractor, SCOSE Version.

.5 Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201-2017, General Conditions of the Contract for Construction, SCOSE Version.

### § 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.

### § 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 Reserved

### § 1.1.9 Notice to Proceed

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The Notice to Proceed is a document issued by the Owner to the Contractor directing the Contractor to begin prosecution of the Work in accordance with the requirements of the Contract Documents. The Notice to Proceed shall fix the date on which the Contract Time will commence and establish the initial date of the Substantial Completion.

**§ 1.1.10 State Engineer**

"State Engineer" means the person holding the position as head of the State Engineer's Office. The State Engineer's Office is created by S.C. Code Ann. § 11-35-830, and is sometimes referred to in the Contract Documents as "Office of State Engineer" or "OSE." The State Engineer is also the Chief Procurement Officer for Construction, sometimes referred to in the Contract Documents as "CPOC".

**§ 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. In the event of patent ambiguities within or between parts of the Contract Documents, the Contractor shall 1) provide the better quality or greater quantity of Work, or 2) comply with the more stringent requirement, either or both in accordance with the Architect's interpretation.

**§ 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, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

**§ 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 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 a violation 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

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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.

**§ 1.6.3** Notice to Contractor shall be to the address provided in Section 8.3.2 of the Agreement. Notice to Owner shall be to the address provided in Section 8.2.2 of the Agreement. Either party may designate a different address for notice by giving notice in accordance with Section 1.6.1.

### § 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, including 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.

## ARTICLE 2 OWNER

### § 2.1 General

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization, except as provided in Section 7.1.7. 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 Representative noted in the Agreement.

**§ 2.1.2** The Owner shall furnish to the Contractor, within fifteen (15) days after receipt of a written request, information necessary and relevant for the Contractor to post Notice of Project Commencement pursuant to S.C. Code Ann. § 29-5-23.

### § 2.2 Reserved

### § 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 a design professional lawfully licensed to practice, or an entity lawfully practicing, in the jurisdiction where the Project is located. The 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. Subject to the Contractor's obligations, including those in Section 3.2, the Contractor shall be entitled to rely on the accuracy of information furnished by the Owner pursuant to this Section but shall exercise proper precautions relating to the safe performance of the Work.


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§ 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. However, the Owner does not warrant the accuracy of any such information requested by the Contractor that is not otherwise required of the Owner by the Contract Documents. Neither the Owner nor the Architect shall be required to conduct investigations or to furnish the Contractor with any information concerning subsurface characteristics or other conditions of the area where the Work is to be performed beyond that which is provided in the Contract Documents.

§ 2.3.6 The Owner shall furnish the Contract Documents to the Contractor in digital format.

### § 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, including but not limited to providing necessary resources, 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 amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

## ARTICLE 3 CONTRACTOR

### § 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction 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 Representative noted in the Agreement.

§ 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.

.1 The Contractor acknowledges that it has investigated and satisfied itself as to the general and local conditions which can affect the Work or its cost, including but not limited to (a) conditions bearing upon transportation, disposal, handling, and storage of materials; (b) the availability of labor, water, electric power, and roads; (c) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (d) the conformation and conditions of the ground; and (e) the character of equipment and facilities needed preliminary to and during work performance.

.2 The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is


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reasonably ascertainable from an inspection of the site, including all exploratory work done by the Owner, as well as from the drawings and specifications made a part of this Contract.

.3 Any failure of the Contractor to take the actions described and acknowledged in this Section will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to the Owner.

**§ 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 latent errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

**§ 3.2.5** The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

### § 3.3 Supervision and Construction Procedures

**§ 3.3.1** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. 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 and provide its findings to the Owner. Unless the Owner 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.


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### § 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.

**§ 3.4.2.1** After the Contract has been executed, the Owner and Architect may consider requests for the substitution of products in place of those specified. The Owner and Architect may, but are not obligated to, consider only those substitution requests that are in full compliance with the conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:

- **.1** represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to the product specified;
- **.2** represents that it will provide the same warranty for the substitution as it would have provided for the product specified;
- **.3** certifies that the cost data presented is complete and includes all related costs for the substituted product and for Work that must be performed or changes as a result of the substitution, except for the Architect's re-design costs, and waives all claims for additional costs related to the substitution that subsequently become apparent;
- **.4** agrees that it shall, if the substitution is approved, coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects; and
- **.5** represents that the request includes a written representation identifying any potential effect the substitution may have on Project's achievement of a Sustainable Measure or the Sustainable Objective.

**§ 3.4.2.2** The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.

**§ 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 shall be considered defective. Unless caused by the Contractor or a subcontractor at any tier, 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. The Contractor shall comply with the requirements of S.C Code Ann. Title 12, Chapter 8, regarding withholding tax for nonresidents, employees, contractors and subcontractors.


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

**§ 3.7.1** Pursuant to S.C. Code Ann. § 10-1-180, no local general or specialty building permits are required for state buildings. Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for all other permits, fees, and licenses 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 the difference between actual costs, as documented by invoices, and the allowances under Section 3.8.2.1.

**§ 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, acceptable to the Owner, 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.



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§ 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 Owner may notify the Contractor, stating whether the Owner has reasonable objection to the proposed superintendent. Failure of the Owner 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 has made reasonable and timely objection. The Contractor shall notify the Owner of any proposed change in the superintendent, including the reason therefore, prior to making such change. 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. Subject to any additional requirements in the Contract Documents, the schedule shall contain detail appropriate for the Project, including at a minimum (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.



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§ 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.

.1 The fire sprinkler shop drawings shall be prepared by a licensed fire sprinkler contractor and shall accurately reflect actual conditions affecting the required layout of the fire sprinkler system. The fire sprinkler contractor shall certify the accuracy of its shop drawings and submit the drawings and hydraulic calculations to the Architect's fire protection engineer (FPE) for review and approval.

.2 The FPE will review, approve, and submit to the Office of State Fire Marshal (OSFM) the fire sprinkler shop drawings and FPE's certification indicating the shop drawings and hydraulic calculations have been reviewed and approved prior to OSFM review.

.3 Unless authorized in writing by OSE, neither the Contractor nor subcontractor at any tier shall submit the fire sprinkler shop drawings directly to OSFM.

§ 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, who shall comply with reasonable requirements of the Owner regarding qualifications and insurance and 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


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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** The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

### § 3.13 Use of Site

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

**§ 3.13.2** The Contractor and any entity for which the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner.

### § 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) including loss of use resulting therefrom, but


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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.

## ARTICLE 4 ARCHITECT

### § 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. Any reference in the Contract Documents to the Architect taking action or rendering a decision with a "reasonable time" is understood to mean no more than ten (10) days, unless otherwise specified in the Contract Documents or otherwise agreed to by the parties.

**§ 4.2.2** The Architect will visit the site as necessary to fulfill its obligation to the Owner for inspection services, if any, and, at a minimum, to assure conformance with the Architect's design as shown in the Contract Documents and to observe 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 informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) deviations from the Contract Documents, (2) 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 Work completed and correlated with 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.


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§ 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, in the first instance, interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. Upon receipt of such request, the Architect will promptly provide the other party with a copy of the request. 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, and will not show partiality to either. Except in the case of interpretations resulting in omissions, defects, or errors in the Instruments of Service or perpetuating omissions, defects or errors in the Instruments of Service, the Architect will not be liable for results of interpretations or decisions rendered in good faith. If either party disputes the Architect's interpretation or decision, that party may proceed as provided in Article 15. The Architect's interpretations and decisions may be, but need not be, accorded any deference in any review conducted pursuant to law or the Contract Documents.

§ 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 so as to avoid delay to the construction of the Project. The Architect's response to such requests will be made in writing with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information. Any response to a request for information must be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings.



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Unless issued pursuant to a Modification, supplemental Drawings or Specifications will not involve an adjustment to the Contract Sum or Contract Time.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

**§ 5.1.1** A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include 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, within fourteen (14) days after posting of the Notice of Intent to Award 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 Owner may notify the Contractor whether the Owner has reasonable objection to any such proposed person or entity. Failure of the Owner 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 has made reasonable and timely objection. The Owner shall not direct the Contractor to contract with any specific individual or entity for supplies or services unless such supplies and services are necessary for completion of the Work and the specified individual or entity is the only source of such supply or service.

**§ 5.2.3** If the Owner has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner 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 makes reasonable objection to such substitution. The Contractor's request for substitution must be made to the Owner in writing, accompanied by supporting information.

**§ 5.2.5** A Subcontractor identified in the Contractor's Bid pursuant to the subcontractor listing requirements of Section 7 of the Bid Form may only be substituted in accordance with and as permitted by the provisions of S.C. Code Ann. § 11-35-3021. A proposed substitute for a listed subcontractor shall also be subject to the Owner's approval as set forth in Section 5.2.3.

**§ 5.2.6** A Contractor may substitute one prospective subcontractor for another, with the approval of the Owner as follows:

.1 If the Contractor requests the substitution, the Contractor is responsible for all costs associated with the substitution.

.2 If the Owner requests the substitution, the Owner is responsible for any resulting increased costs to the Contractor.

### § 5.3 Subcontractual Relations

**§ 5.3.1** By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work 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


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prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise herein, or 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.

**§ 5.3.2** Without limitation on the generality of Section 5.3.1, each Subcontract agreement and each Sub-subcontract agreement shall include, and shall be deemed to include, the following Sections of these General Conditions: 3.2, 3.5, 3.18, 5.3, 5.4, 6.2.2, 7.1.6, 7.3.3, 7.5, 13.1, 13.9, 14.3, 14.4, and 15.1.7.

**§ 5.3.3** Each Subcontract Agreement and each Sub-subcontract agreement shall exclude, and shall be deemed to exclude, Sections 13.2 and 13.5 and all of Article 15, except Section 15.1.7, of these General Conditions. In the place of these excluded sections of the General Conditions, each Subcontract Agreement and each Sub-subcontract may include Sections 13.2 and 13.5 and all of Article 15, except Section 15.1.7, of AIA Document A201-2007, Conditions of the Contract, as originally issued by the American Institute of Architects.

**§ 5.3.4** The Contractor shall assure the Owner that all agreements between the Contractor and its Subcontractor incorporate the provisions of Section 5.3.1 as necessary to preserve and protect the rights of the Owner and the Architect under the Contract Documents with respect to the work to be performed by Subcontractors so that the subcontracting thereof will not prejudice such rights. The Contractor's assurance shall be in the form of an affidavit or in such other form as the Owner may approve. Upon request, the Contractor shall provide the Owner or Architect with copies of any or all subcontracts or purchase orders.

### § 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.

**§ 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.

**§ 5.4.4** Each subcontract shall specifically provide that the Owner shall only be responsible to the subcontractor for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

**§ 5.4.5** Each subcontract shall specifically provide that the Subcontractor agrees to perform portions of the Work assigned to the Owner in accordance with the Contract Documents.

**§ 5.4.6** Nothing in this Section 5.4 shall act to reduce or discharge the Contractor's payment bond surety's obligations to claimants for claims arising prior to the Owner's exercise of any rights under this conditional assignment.

## ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

### § 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


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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 Reserved**

**§ 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.

## ARTICLE 7 CHANGES IN THE WORK

**§ 7.1 General**

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

**§ 7.1.2** A Change Order shall be based upon agreement among the Owner, 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.


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

§ 7.1.4 If a change in the Work provides for an adjustment to the Contract Sum, the amount of such adjustment must be computed and documented in writing. In order to facilitate evaluation of proposals or claims for increases and decreases to the Contract Sum, all proposals or claims, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized. Where major cost items are subcontracts, they shall be itemized also. The amount of the adjustment must approximate the actual cost to the Contractor and all costs incurred by the Contractor must be justifiably compared with prevailing industry standards. Except as provided in Section 7.1.5, all adjustments to the Contract Sum shall be limited to job specific costs and shall not include indirect costs, home office overhead or profit.

§ 7.1.5 The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces, not to exceed seventeen (17%) percent of the Contractor's actual costs.

.2 For the Contractor, for Work performed by the Contractor's Subcontractors, not to exceed ten (10%) percent of each Subcontractor's actual costs (not including the Subcontractor's overhead and profit).

.3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, not to exceed seventeen (17%) percent of the Subcontractor's actual costs.

.4 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.4.

The percentages cited above shall be considered to include all indirect costs including, but not limited to field and office managers, supervisors and assistants, incidental job burdens, small tools, and general overhead allocations.

§ 7.1.6 The procedures described in Sections 7.1.4 and 7.1.5 shall be used to calculate any adjustment in the Contract Sum, including without limitation an adjustment permitted under Articles 7, 9, 14, or 15.

§ 7.1.7 If a change in the Work requires an adjustment to the Contract Sum that exceeds the limits of the Owner's Construction Change Order Certification (reference Section 9.1.9 of the Agreement), then the Owner's agreement is not effective, and Work may not proceed until approved in writing by the OSE.

§ 7.1.8 Additional Work performed after the declaration of Substantial Completion must be approved by OSE, if the Change Order exceeds the Owner's Construction Change Order Certification.

**§ 7.2 Change Orders**

§ 7.2.1 A Change Order is a written instrument, using the OSE Construction Change Order form, 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.

Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, any adjustments to the Contract Sum or the Contract Time.

§ 7.2.2 At the Owner's request, the Contractor shall prepare a proposal to perform the work of a proposed Change Order setting forth the amount of the proposed adjustment, if any, in the Contract Sum; and the extent of the proposed adjustment, if any, in the Contract Time. Any proposed adjustment in the Contract Sum shall be prepared in accordance with Section 7.1.4 and 7.1.5. The Owner's request shall include any revisions to the Drawings or Specifications necessary to define any changes in the Work. Within fourteen (14) days of receiving the request, the Contractor shall submit the proposal to the Owner and Architect along with all documentation required by Section 7.5.

§ 7.2.3 If the Contractor requests a Change Order, the request shall set forth the proposed change in the Work and shall be prepared in accordance with Section 7.2.2. If the Contractor requests a change to the Work that involves a revision


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to either the Drawings or Specifications, the Contractor shall reimburse the Owner for any expenditure associated with the Architects' review of the proposed revisions, except to the extent the revisions are accepted by execution of a Change Order.

**§ 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 if properly itemized and substantiating data is not available to permit evaluation;

.2 Unit prices specified in the Contract Documents or subsequently agreed upon, subject to adjustment if any, as provided in Section 9.1.2;

.3 Cost and a percentage fee, calculated as described in Sections 7.1.4 and 7.1.5;

.4 in another manner as the parties may agree; or

.5 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 make an initial determination, consistent with Section 7.3.3, of the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.1.5. 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; and

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related 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 cost including overhead and profit as confirmed by the Architect from the Schedule of Values.

**§ 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


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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.

### § 7.5 Pricing Data and Audit

### § 7.5.1 Cost or Pricing Data

Upon request of the Owner or Architect, Contractor shall submit cost or pricing data prior to execution of a Modification which exceeds $500,000 [Reference S.C. Code Ann. §§ 11-35-1830 and 11-35-2220, and SC Code Ann. Reg 19-445.2120]. Contractor shall certify that, to the best of its knowledge and belief, the cost or pricing data submitted is accurate, complete, and current as of a mutually determined specified date prior to the date of pricing the Modification. Contractor's price, including profit, shall be adjusted to exclude any significant sums by which such price was increased because Contractor furnished cost or pricing data that was inaccurate, incomplete, or not current as of the date specified by the parties. Notwithstanding Subparagraph 9.10.4, such adjustments may be made after final payment to the Contractor.

**§ 7.5.2** Cost or pricing data means all facts that, as of the date specified by the parties, prudent buyers and sellers would reasonably expect to affect price negotiations significantly. Cost or pricing data are factual, not judgmental; and are verifiable. While they do not indicate the accuracy of the prospective contractor's judgment about estimated future costs or projections, they do include the data forming the basis for that judgment. Cost or pricing data are more than historical accounting data; they are all the facts that can be reasonably expected to contribute to the soundness of estimates of future costs and to the validity of determinations of costs already incurred.

### § 7.5.3 Records Retention

As used in Section 7.5, the term "Records" means any books or records that relate to cost or pricing data of a Change Order that Contractor is required to submit pursuant to Section 7.5.1. Contractor shall maintain records for three years from the date of final payment, or longer if requested by the chief procurement officer. The Owner may audit Contractor's records at reasonable times and places.

## ARTICLE 8 TIME

### § 8.1 Definitions

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

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

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

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

### § 8.2 Progress and Completion

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


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§ 8.2.2 The Contractor shall not knowingly commence the Work prior to the effective date of surety bonds and 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 dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time, the Contract Time shall be extended for such reasonable time as the Architect may determine, provided the delay:

.1 is not caused by the fault or negligence of the Contractor or a subcontractor at any tier, and

.2 is not due to unusual delay in the delivery of supplies, machinery, equipment, or services when such supplies, machinery, equipment, or services were obtainable from other sources in sufficient time for the Contractor to meet the required delivery.

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

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 Contract Sum

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

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

### § 9.2 Schedule of Values

§ 9.2.1 The Contractor shall submit a schedule of values to the Architect within ten (10) days of full execution of the Agreement, 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.

§ 9.2.2 As requested by the Architect, the Contractor and each Subcontractor shall prepare a trade payment breakdown for the Work for which each is responsible. The breakdown, being submitted on a uniform standardized format approved by the Architect and Owner, shall be divided in detail, using convenient units, sufficient to accurately determine the value of completed Work during the course of the Project. The Contractor shall update the schedule of values as required by either the Architect or Owner as necessary to reflect:

.1 the description of Work (listing labor and material separately);

.2 the total value of the Work;

.3 the percent and value of the Work completed to date;

.4 the percent and value of previous amounts billed; and

.5 the current percent completed, and amount billed.



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§ 9.2.3 Any schedule of values or trade breakdown that fails to provide sufficient detail, is unbalanced, or exhibits "front-loading" of the value of the Work shall be rejected. If a schedule of values or trade breakdown is used as the basis for payment and later determined to be inaccurate, sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (exclusive of normal retainage) to complete the Work.

### § 9.3 Applications for Payment

§ 9.3.1 Monthly, 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 as 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, provided such materials or equipment will be subsequently incorporated in the Work. 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. The Contractor shall 1) protect such materials from diversion, vandalism, theft, destruction, and damage, 2) mark such materials specifically for use on the Project, and 3) segregate such materials from other materials at the storage facility. The Architect and the Owner shall have the right to make inspections of the storage areas at any time.

§ 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 in both the Application for Payment and, if required to be submitted, the accompanying current construction schedule, 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,


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methods, techniques, sequences, or procedures; or (3) 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 shall 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. The Architect shall withhold a Certificate of Payment if the Application for Payment is not accompanied by the current construction schedule required by Section 3.10.1. 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** Pursuant to S.C. Ann. §§ 29-6-10 through 29-6-60, 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.


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§ 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 to the Owner, 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 time established in the Contract Documents, the amount certified by the Architect or awarded by final dispute resolution order, 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 written 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, the Owner, and any other party the Architect or the Owner choose, will make an inspection on a date and at a time mutually agreeable to determine whether the Work or designated portion thereof is substantially complete. The Contractor shall furnish access for the inspection and testing as provided in this Contract. The inspection shall include a demonstration by the Contractor that all equipment, systems and operable components of the Work function properly and in accordance with the Contract Documents.

.1 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.

.2 If more than one Substantial Completion inspection is required, the Contractor shall reimburse the Owner for all costs of re-inspections or, at the Owner's option, the costs may be deducted from payments due to the Contractor.

.3 Representatives of the State Fire Marshal's Office and other authorities having jurisdiction may be present at the Substantial Completion inspection or otherwise inspect the completed Work and advise the Owner whether the Work meets their respective requirements for the Project.


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§ 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 for its written acceptance of responsibilities assigned in the Certificate and a copy of the signed Certificate shall be delivered to the Contractor. Upon such acceptance, 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.

§ 9.8.6 If the Architect and Owner concur in the Contractor's assessment that the Work or a portion of the Work is safe to occupy, the Owner and Contractor may arrange for a Certificate of Occupancy inspection by OSE. The Owner, Architect, and Contractor shall be present at OSE's inspection. Upon verifying that the Work or a portion of the Work is substantially complete and safe to occupy, OSE will issue, as appropriate, a Full or Partial Certificate of Occupancy.

§ 9.8.7 The Owner may not occupy the Work until all required occupancy permits, if any, have been issued and delivered to the Owner.

### § 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 Unless the parties agree otherwise in the Certificate of Substantial Completion, the Contractor shall achieve Final Completion within thirty days after Substantial Completion. 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, the Owner, and any other party the Architect or the Owner choose will make an inspection on a date and at a time mutually agreeable. 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.

.1 If more than one Final Completion inspection is required, the Contractor shall reimburse the Owner for all costs of re-inspections or, at the Owner's option, the costs may be deducted from payments due to the Contractor.

.2 If the Contractor does not achieve Final Completion within thirty days after Substantial Completion or the timeframe agreed to by the parties in the Certificate of Substantial Completion, whichever is


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greater, the Contractor shall be responsible for any additional Architectural fees resulting from the delay.

.3 If OSE has not previously issued a Certificate of Occupancy for the entire Project, the Parties shall arrange for a representative of OSE to participate in the Final Completion inspection.

**§ 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,

.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,

.7 required Training Manuals,

.8 equipment Operations and Maintenance Manuals,

.9 any certificates of testing, inspection or approval required by the Contract Documents and not previously provided, and

10. one copy of the Documents required by Section 3.11.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is delayed 60 days 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 specific claims in stated amounts that have been previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

### § 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


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.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 which was not discoverable as provided in Section 3.2.1 and not addressed in the Contract Documents, and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons or serious loss to real or personal property resulting from such a material or substance 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. Hazardous materials or substances are those hazardous, toxic, or radioactive materials or substances subject to regulations by applicable governmental authorities having jurisdiction, such as, but not limited to, the S.C. Department of Health and Environmental Control, the U.S. Environmental Protection Agency, and the U.S. Nuclear Regulatory Commission.

**§ 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


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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. In the absence of agreement, the Architect will make an interim determination regarding any delay or impact on the Contractor's additional costs. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the rights of either party to disagree and assert a Claim in accordance with Article 15.

**§ 10.3.3** The Work in the affected area shall be resumed immediately following the occurrence of any one of the following events: (a) the Owner causes remedial work to be performed that results in the absence of hazardous materials or substances; (b) the Owner and the Contractor, by written agreement, decide to resume performance of the Work; or (c) the Work may safely and lawfully proceed, as determined by an appropriate governmental authority or as evidenced by a written report to both the Owner and the Contractor, which is prepared by an environmental engineer reasonably satisfactory to both the Owner and the Contractor.

**§ 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** In addition to its obligations under Section 3.18, 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 Reserved**

**§ 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. The Contractor shall immediately give the Owner and Architect notice of the emergency. This initial notice may be oral followed within five (5) days by a written notice setting forth the nature and scope of the emergency. Within fourteen (14) days of the start of the emergency, the Contractor shall give the Architect a written estimate of the cost and probable effect of delay on the progress of the Work.

## ARTICLE 11 INSURANCE AND BONDS

**§ 11.1 Contractor's Insurance and Bonds**

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


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

**§ 11.1.5 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner and all additional insureds of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Owner: (1) the Owner, upon receipt of notice from the Contractor, 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 not be equitably adjusted; and (3) the Contractor waives all rights against the Owner to the extent any loss to the Contractor, Subcontractors, and Sub-subcontractors would have been covered by the insurance had it not expired or been cancelled. If the Owner purchases replacement coverage, the cost of the insurance shall be charged to the Contractor by an appropriate Change Order. 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 Reserved**

**§ 11.2.3 Reserved**

**§ 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.

**§ 11.3.3 Limitation on the Owner's Waiver of Subrogation**

South Carolina law prohibits the State from indemnifying a private party. Accordingly, and notwithstanding anything in the Agreement to the contrary, including but not limited to Sections 11.3.1, 11.3.2. and 11.4, the Owner cannot and


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does not waive subrogation to the extent any losses are covered by insurance provided by the South Carolina Insurance Reserve Fund.

### § 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 Contractors as fiduciary and made payable to the Contractor 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 Contractor shall pay the Architect and Owner their just shares of insurance proceeds received by the Contractor, and by appropriate agreements the Architect and Owner shall make payments to their consultants and separate contractors in similar manner.

**§ 11.5.2** Prior to settlement of an insured loss, the Contractor shall notify the Owner of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Owner shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Owner does not object, the Contractor shall settle the loss and the Owner shall be bound by the settlement and allocation. Upon receipt, the Contractor 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 Owner timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Contractor may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

**§ 11.5.3** If required in writing by a party in interest, the Contractor as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Contractor's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Contractor shall deposit in a separate account proceeds so received, which the Contractor shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor.

## ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

### § 12.1 Uncovering of Work

**§ 12.1.1** If a portion of the Work is covered contrary to the requirements specifically expressed in the Contract Documents, including inspections of work-in-progress required by all authorities having jurisdiction over the Project, it must, upon demand of the Architect or authority having jurisdiction, be uncovered for observation/inspection 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 unless the condition was caused by the Owner or a Separate Contractor in which event the Owner shall be responsible for payment of such costs.

### § 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.


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.1 If the Contractor, a Subcontractor, or anyone for whom either is responsible, uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing, and other building systems, machinery, equipment, or other mechanical device, the Contractor shall cause such item to be restored to "like new" condition at no expense to the Owner.

**§ 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. 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 unless otherwise provided in the Contract Documents.

**§ 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.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

**§ 13.1 Governing Law**

**§ 13.1.1** The Contract, any dispute, claim, or controversy relating to the Contract, and all the rights and obligations of the parties shall, in all respects, be interpreted, construed, enforced and governed by and under the laws of the State of South Carolina, except its choice of law rules.

**§ 13.1.2** This Contract is formed pursuant to and governed by the South Carolina Consolidated Procurement Code and is deemed to incorporate all applicable provisions thereof and the ensuing regulations.

**§ 13.2 Successors and Assigns**

The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole, or in part, without written consent of the other and then only in accordance with and as permitted by Regulation 19-445.2180 of the South Carolina Code of Regulations, as amended. If either party attempts


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to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**§ 13.3 Rights and Remedies**

**§ 13.3.1** Unless expressly provided otherwise, 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.

**§ 13.3.3** Notwithstanding Section 9.10.4, the rights and obligations which, by their nature, would continue beyond the termination, cancellation, rejection, or expiration of this contract shall survive such termination, cancellation, rejection, or expiration, including, but not limited to, the rights and obligations created by the following clauses:

**1.5 Ownership and Use of Drawings, Specifications and Other Instruments of Service;**
**3.5 Warranty**
**3.17 Royalties, Patents and Copyrights**
**3.18 Indemnification**
**7.5 Pricing Data and Audit**
**A.3.2.2 Contractor's Liability Insurance (A101, Exhibit A)**
**A.3.5 Performance and Payment Bond (A101, Exhibit A)**
**15.1.7 Claims for Listed Damages**
**15.1.8 Waiver of Claims Against the Architect**
**15.6 Dispute Resolution**
**15.6.5 Service of Process**

**§ 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 Owner and Architect timely notice of when and where tests and inspections are to be made so that they 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.

.1 Inspection, Special Inspections, and testing requirements, if any, as required by the ICC series of Building Codes shall be purchased by the Owner.

.2 Contractor shall schedule and request inspections in an orderly and efficient manner and shall notify the Owner whenever the Contractor schedules an inspection. Contractor shall be responsible for the cost of inspections scheduled and conducted without the Owner's knowledge and for any increase in the cost of inspections resulting from the inefficient scheduling of inspections.

**§ 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 Owner and 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 and shall be deducted from future Applications of Payment.


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**§ 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 to the Contractor and unpaid under the Contract Documents shall bear interest only if and to the extent allowed by S.C. Code Ann. §§ 29-6-10 through 29-6-60. Amounts due to the Owner shall bear interest at the rate of one percent a month or a pro rata fraction thereof on the unpaid balance as may be due.

### § 13.6 Procurement of Materials by Owner

The Contractor accepts assignment of all purchase orders and other agreements for procurement of materials and equipment by the Owner that are identified as part of the Contract Documents. The Contractor shall, upon delivery, be responsible for the storage, protection, proper installation, and preservation of such Owner purchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation, and testing of items covered in any assigned purchase orders or agreements. Unless the Contract Documents specifically provide otherwise, all Contractor warranty of workmanship and correction of the Work obligations under the Contract Documents shall apply to the Contractor's installation of and modifications to any Owner purchased items.

### § 13.7 Interpretation of Building Codes

As required by S.C. Code Ann. § 10-1-180, OSE shall determine the enforcement and interpretation of all building codes and referenced standards on state buildings. The Contractor shall refer any questions, comments, or directives from local officials to the Owner and OSE for resolution.

### § 13.8 Reserved

### § 13.9 Illegal Immigration

Contractor certifies and agrees that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws and agrees to provide to the State upon request any documentation required to establish either: (a) that Title 8, Chapter 14 is inapplicable both to Contractor and its subcontractors or sub-subcontractors; or (b) that Contractor and its subcontractors or sub-subcontractors are in compliance with Title 8, Chapter 14. Pursuant to Section 8-14-60, "A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony and, upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both." Contractor agrees to include in any contracts with its subcontractor's language requiring its subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in their contracts with the sub-subcontractor's language requiring the sub-subcontractors to comply with the applicable requirements of Title 8, Chapter 14. (An overview is available at www.procurement.sc.gov)

### § 13.10 Drug-Free Workplace

The Contractor must comply with the Drug-Free Workplace Act, S.C. Code Ann. §§ 44-107-10, et seq. The Contractor certifies to the Owner that Contractor will provide a Drug-Free Workplace, as defined by S.C. Code Ann. § 44-107-20(1).

### § 13.11 False Claims

According to S.C. Code Ann. § 16-13-240, "a person who by false pretense or representation obtains the signature of a person to a written instrument or obtains from another person any chattel, money, valuable security, or other property, real or personal, with intent to cheat and defraud a person of that property is guilty" of a crime.


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### § 13.12 Prohibited Acts

It is unlawful for a person charged with disbursements of state funds appropriated by the General Assembly to exceed the amounts and purposes stated in the appropriations. (§ 11-9-20) It is unlawful for an authorized public officer to enter into a contract for a purpose in which the sum is in excess of the amount appropriated for that purpose. It is unlawful for an authorized public officer to divert or appropriate the funds arising from any tax levied and collected for any one fiscal year to the payment of an indebtedness contracted or incurred for a previous year. (§ 11-1-40)

### § 13.13 Open Trade (Jun 2015)

During the contract term, including any renewals or extensions, Contractor will not engage in the boycott of a person or an entity based in or doing business with a jurisdiction with whom South Carolina can enjoy open trade, as defined in S.C. Code Ann. § 11-35-5300.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

**§ 14.1.1** The Contractor may terminate the Contract if the Work is stopped for a period of 45 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 substantially all Work to be stopped; or

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.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 and the Contractor has stopped work in accordance with Section 9.7.

**§ 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, 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 persistently 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, or otherwise fails to prosecute the Work, or any separable part of the Work, with the diligence, resources and skill that will ensure its completion within the time specified in the Contract Documents, including any authorized adjustments;

.2 fails to make payment to Subcontractors or suppliers in accordance with the Contract Documents and 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, 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:


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.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 Architect, upon application, and this obligation for payment shall survive termination of the Contract.

**§ 14.2.5** If, after termination for cause, it is determined that the Owner lacked justification to terminate under Section 14.2.1, or that the Contractor's default was excusable, or that the termination for cause was affected by any other error, then Owner and Contractor agree that the termination shall be conclusively deemed to be one for the convenience of the Owner, and the rights and obligations of the parties shall be the same as if the termination had been issued for in Section 14.4.

**§ 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. 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 in whole or in part for the Owner's convenience and without cause. The Owner shall give notice of the termination to the Contractor specifying the part of the Contract terminated and when termination becomes effective.

**§ 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;
.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders; and
.4 complete the performance of the Work not terminated, if any.

**§ 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 any other adjustments otherwise set forth in the Agreement.

**§ 14.4.4** Contractor's failure to include an appropriate termination for convenience clause in any subcontract shall not (i) affect the Owner's right to require the termination of a subcontract, or (ii) increase the obligation of the Owner beyond what it would have been if the subcontract had contained an appropriate clause.

**§ 14.4.5** Upon written consent of the Contractor, the Owner may reinstate the terminated portion of this Contract in whole or in part by amending the notice of termination if it has been determined that:
.1 the termination was due to withdrawal of funding by the General Assembly, Governor, or State Fiscal Accountability Authority or the need to divert project funds to respond to an emergency as defined by Regulation 19-445.2110(B) of the South Carolina Code of Regulations, as amended;


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.2 funding for the reinstated portion of the Work has been restored;
.3 circumstances clearly indicate a requirement for the terminated Work; and
.4 reinstatement of the terminated work is advantageous to the Owner.

## ARTICLE 15 CLAIMS AND DISPUTES

### § 15.1 Claims

#### § 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. A voucher, invoice, payment application or other routine request for payment that is not in dispute when submitted is not a Claim under this definition. 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 Reserved

#### § 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 Architect. Such notice shall include sufficient information to advise the Architect and other party of the circumstances giving rise to the Claim, the specific contractual adjustment or relief requested and the basis of such request. 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 except as stated for adverse weather days in Section 15.1.6.2. By failing to give written notice of a Claim within the time required by this Section, a party expressly waives its Claim.

**§ 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 Architect is required.

#### § 15.1.4 Continuing Contract Performance

**§ 15.1.4.1** Pending final resolution of a Claim, including any administrative review allowed under Section 15.6, 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 Architect'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. Claims for an increase in the Contract Time shall be based on one additional calendar day for each full calendar day that the Contractor is prevented from working.

**§ 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.

.1 Claims for adverse weather shall be based on actual weather conditions at the job site or other place of performance of the Work, as documented in the Contractor's job site log.

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.2 For the purpose of this Contract, a total of five (5) days per calendar month (non-cumulative) shall be anticipated as "adverse weather" at the job site, and such time will not be considered justification for an extension of time. If, in any month, adverse weather develops beyond the five (5) days, the Contractor shall be allowed to claim additional days to compensate for the excess weather delays only to the extent of the impact on the approved construction schedule and days the Contractor was already scheduled to work. The remedy for this condition is for an extension of time only and is exclusive of all other rights and remedies available under the Contract Documents or imposed or available by law.

.3 The Contractor shall submit monthly with their pay application all Claims for adverse weather conditions that occurred during the previous month. The Architect shall review each monthly submittal in accordance with Section 15.5 and inform the Contractor and the Owner promptly of its evaluation. Approved days shall be included in the next Change Order issued by the Architect. Adverse weather conditions not claimed within the time limits of this Subparagraph shall be considered to be waived by the Contractor. Claims will not be allowed for adverse weather days that occur after the scheduled (original or adjusted) date of Substantial Completion.

**§ 15.1.6.3** Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the work, and the number of days increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

**§ 15.1.6.4** The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

### § 15.1.7 Claims for Listed Damages

Notwithstanding any other provision of the Contract Documents, including Section 1.2.1, but subject to a duty of good faith and fair dealing, the Contractor and Owner waive Claims against each other for listed damages arising out of or relating to this Contract.

**§ 15.1.7.1** For the Owner, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) costs suffered by a third party unable to commence work, (vi) attorney's fees, (vii) any interest, except to the extent allowed by Section 13.5 (Interest), (viii) lost revenue and profit for lost use of the property, (ix) costs resulting from lost productivity or efficiency.

**§ 15.1.7.2** For the Contractor, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) attorney's fees, (vi) any interest, except to the extent allowed by Section 13.5 (Interest); (vii) unamortized equipment costs; and, (viii) losses incurred by subcontractors for the types of damages the Contractor has waive as against the Owner. Without limitation, this mutual waiver is applicable to all damages due to either party's termination in accordance with Article 14.

**§ 15.1.7.3** Nothing contained in this Section shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents. This mutual waiver is not applicable to amounts due or obligations under Section 3.18 (Indemnification).

### § 15.1.8 Waiver of Claims Against the Architect

Notwithstanding any other provision of the Contract Documents, including Section 1.2.1, but subject to a duty of good faith and fair dealing, the Contractor waives all claims against the Architect and any other design professionals who provide design and/or project management services to the Owner, either directly or as independent contractors or subcontractors to the Architect, for listed damages arising out of or relating to this Contract. The listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) attorney's fees, (vi) any interest; (vii) unamortized equipment costs; and, (viii) losses incurred by subcontractors for the types of damages the Contractor has waive as against the Owner. This mutual waiver is not applicable to amounts due or obligations under Section 3.18 (Indemnification).


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§ 15.2 Reserved

§ 15.3 Reserved

§ 15.4 Reserved

§ 15.5 Claim and Disputes - Duty of Cooperation, Notice, and Architects Initial Decision

§ 15.5.1 Contractor and Owner are fully committed to working with each other throughout the Project to avoid or minimize Claims. To further this goal, Contractor and Owner agree to communicate regularly with each other and the Architect at all times notifying one another as soon as reasonably possible of any issue that if not addressed may cause loss, delay, and/or disruption of the Work. If Claims do arise, Contractor and Owner each commit to resolving such Claims in an amicable, professional, and expeditious manner to avoid unnecessary losses, delays, and disruptions to the Work.

§ 15.5.2 Claims shall first be referred to the Architect for initial decision. An initial decision shall be required as a condition precedent to resolution pursuant to Section 15.6 of any Claim arising prior to the date of final payment, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered, or after all the Architect's requests for additional supporting data have been answered, whichever is later. The Architect will not address Claims between the Contractor and persons or entities other than the Owner.

§ 15.5.3 The Architect will review Claims and within ten days of the receipt of a Claim (1) request additional supporting data from the claimant or a response with supporting data from the other party or (2) render an initial decision in accordance with Section 15.5.5.

§ 15.5.4 If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Architect when the response or supporting data will be furnished or (3) advise the Architect that all supporting data has already been provided. Upon receipt of the response or supporting data, the Architect will render an initial decision in accordance with Section 15.5.5.

§ 15.5.5 The Architect will render an initial decision in writing; (1) stating the reasons therefor; and (2) notifying the parties of any change in the Contract Sum or Contract Time or both. The Architect will deliver the initial decision to the parties within two weeks of receipt of any response or supporting data requested pursuant to Section 16.4 or within such longer period as may be mutually agreeable to the parties. If the parties accept the initial decision, the Architect shall prepare a Change Order with appropriate supporting documentation for the review and approval of the parties and the Office of State Engineer. If either the Contractor, Owner, or both, disagree with the initial decision, the Contractor and Owner shall proceed with dispute resolution in accordance with the provisions of Section 15.6.

§ 15.5.6 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.

§ 15.6 Dispute Resolution

§ 15.6.1 If a Claim is not resolved pursuant to Section 15.5 to the satisfaction of either party, both parties shall attempt to resolve the dispute at the field level through discussions between Contractor's Representative and Owner's Representative. If a dispute cannot be resolved through Contractor's Representative and Owner's Representative, then the Contractor's Senior Representative and the Owner's Senior Representative, upon the request of either party, shall meet as soon as conveniently possible, but in no case later than twenty-one (21) days after such a request is made, to attempt to resolve such dispute. Prior to any meetings between the Senior Representatives, the parties will exchange relevant information that will assist the parties in resolving their dispute. The meetings required by this Section are a condition precedent to resolution pursuant to Section 15.6.2.

§ 15.6.2 If after meeting in accordance with the provisions of Section 15.6.1, the Senior Representatives determine that the dispute cannot be resolved on terms satisfactory to both the Contractor and the Owner, then either party may submit the dispute by written request to South Carolina's Chief Procurement Officer for Construction (CPOC). Except as otherwise provided in Article 15, all Claims, or controversies relating to the Contract shall be resolved exclusively by the appropriate Chief Procurement Officer in accordance with Title 11, Chapter 35, Article 17 of the


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South Carolina Code of Laws, or in the absence of jurisdiction, only in the Court of Common Pleas for, or in the absence of jurisdiction a federal court located in, Richland County, State of South Carolina. Contractor agrees that any act by the State regarding the Contract is not a waiver of either the State's sovereign immunity or the State's immunity under the Eleventh Amendment of the United States Constitution.

**§ 15.6.3** If any party seeks resolution to a dispute pursuant to Section 15.6.2, the parties shall participate in non-binding mediation to resolve the Claim. If the Claim is governed by Title 11, Chapter 35, Article 17 of the South Carolina Code of Laws as amended and the amount in controversy is $100,000.00 or less, the CPOC shall appoint a mediator, otherwise, the mediation shall be conducted by an impartial mediator selected by mutual agreement of the parties, or if the parties cannot so agree, a mediator designated by the American Arbitration Association ("AAA") pursuant to its Construction Industry Mediation Rules. The mediation will be governed by and conducted pursuant to a mediation agreement negotiated by the parties or, if the parties cannot so agree, by procedures established by the mediator.

**§ 15.6.4** Without relieving any party from the other requirements of Sections 15.5 and 15.6, either party may initiate proceedings in the appropriate forum prior to initiating or completing the procedures required by Sections 15.5 and 15.6 if such action is necessary to preserve a claim by avoiding the application of any applicable statutory period of limitation or repose.

**§ 15.6.5 Service of Process**

Contractor consents that any papers, notices, or process necessary or proper for the initiation or continuation of any Claims, or controversies relating to the Contract; for any court action in connection therewith; or for the entry of judgment on any award made, may be served on Contractor by certified mail (return receipt requested) addressed to Contractor at the address provided for the Contractor's Senior Representative or by personal service or by any other manner that is permitted by law, in or outside South Carolina. Notice by certified mail is deemed duly given upon deposit in the United States mail.

## ARTICLE 16 PROJECT-SPECIFIC REQUIREMENTS AND INFORMATION


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# SE-355
# PERFORMANCE BOND

**KNOW ALL MEN BY THESE PRESENTS**, that *(Insert full name or legal title and address of Contractor)*

Name: _____

Address: _____

_____

hereinafter referred to as "Contractor", and *(Insert full name and address of principal place of business of Surety)*

Name: _____

Address: _____

_____

hereinafter called the "surety", are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: Spartanburg Community College

Address: 136 Community College Drive

Spartanburg, South Carolina 29303

hereinafter referred to as "Agency", or its successors or assigns, the sum of _____ ($ ), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

**WHEREAS**, Contractor has by written agreement dated _____ entered into a contract with Agency to construct

State Project Name: Powers Building A-Wing

State Project Number: H59-6353-JM

Brief Description of Awarded Work: _____

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: Craig Gaulden Davis, LLC | PBK Architecture

Address: 19 Washington Park

Greenville, South Carolina 29601

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

**IN WITNESS WHEREOF**, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

**DATED this _____ day of _____, 2_____** **BOND NUMBER** _____

*(shall be no earlier than Date of Contract)*

| **CONTRACTOR** | **SURETY** |
|---|---|
| **By:** _____ **(Seal)** | **By:** _____ **(Seal)** |
| **Print Name:** _____ | **Print Name:** _____ |
| **Print Title:** _____ | **Print Title:** _____ *(Attach Power of Attorney)* |
| **Witness:** _____ | **Witness:** _____ |

*(Additional Signatures, if any, appear on attached page)*

# SE-355
# PERFORMANCE BOND

**NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

**1**. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency for the full and faithful performance of the contract, which is incorporated herein by reference.

**2**. If the Contractor performs the contract, the Surety and the Contractor have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

**3.** The Surety's obligation under this Bond shall arise after:

**3.1** The Agency has notified the Contractor and the Surety at the address described in paragraph 10 below, that the Agency is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If the Agency, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the Agency's right, if any, subsequently to declare a Contractor Default; or

**3.2** The Agency has declared a Contractor Default and formally terminated the Contractor's right to complete the Contract.

**4.** The Surety shall, within 15 days after receipt of notice of the Agency's declaration of a Contractor Default, and at the Surety's sole expense, take one of the following actions:

**4.1** Arrange for the Contractor, with consent of the Agency, to perform and complete the Contract; or

**4.2** Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

**4.3** Obtain bids or negotiated proposals from qualified contractors acceptable to the Agency for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the Agency and the contractor selected with the Agency's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the Agency the amount of damages as described in paragraph 7 in excess of the Balance of the Contract Sum incurred by the Agency resulting from the Contractor Default; or

**4.4** Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and:

**4.4.1** After investigation, determine the amount for which it may be liable to the Agency and, within 60 days of waiving its rights under this paragraph, tender payment thereof to the Agency; or

**4.4.2** Deny liability in whole or in part and notify the Agency, citing the reasons therefore.

**5.** Provided Surety has proceeded under paragraphs 4.1, 4.2, or 4.3, the Agency shall pay the Balance of the Contract Sum to either:

**5.1** Surety in accordance with the terms of the Contract; or

**5.2** Another contractor selected pursuant to paragraph 4.3 to perform the Contract.

**5.3** The balance of the Contract Sum due either the Surety or another contractor shall be reduced by the amount of damages as described in paragraph 7.

**6.** If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond 15 days after receipt of written notice from the Agency to the Surety demanding that the Surety perform its obligations under this Bond, and the Agency shall be entitled to enforce any remedy available to the Agency.

**6.1** If the Surety proceeds as provided in paragraph 4.4 and the Agency refuses the payment tendered or the Surety has denied liability, in whole or in part, then without further notice the Agency shall be entitled to enforce any remedy available to the Agency.

**6.2** Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the Dispute Resolution process defined in the Contract Documents and the laws of the State of South Carolina.

**7.** After the Agency has terminated the Contractor's right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Agency shall be those of the Contractor under the Contract, and the responsibilities of the Agency to the Surety shall those of the Agency under the Contract. To a limit of the amount of this Bond, but subject to commitment by the Agency of the Balance of the Contract Sum to mitigation of costs and damages on the Contract, the Surety is obligated to the Agency without duplication for:

**7.1** The responsibilities of the Contractor for correction of defective Work and completion of the Contract; and

**7.2** Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and

**7.3** Damages awarded pursuant to the Dispute Resolution Provisions of the Contract. Surety may join in any Dispute Resolution proceeding brought under the Contract and shall be bound by the results thereof; and

**7.4** Liquidated Damages, or if no Liquidated Damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor.

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

**9.** The Surety hereby waives notice of any change, including changes of time, to the contract or to related subcontracts, purchase orders and other obligations.

**10.** Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the address shown on the signature page.

**11.** Definitions

**11.1** Balance of the Contract Sum: The total amount payable by the Agency to the Contractor under the Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts to be received by the Agency in settlement of insurance or other Claims for damages to which the Contractor si entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.

**11.2** Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform the Contract or otherwise to comply with the terms of the Contract.

# SE-357
# LABOR & MATERIAL PAYMENT BOND

**KNOW ALL MEN BY THESE PRESENTS**, that *(Insert full name or legal title and address of Contractor)*

Name: _____

Address: _____

_____

hereinafter referred to as "Contractor", and *(Insert full name and address of principal place of business of Surety)*

Name: _____

Address: _____

_____

hereinafter called the "surety", are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: Spartanburg Community College

Address: 136 Community College Drive

Spartanburg, South Carolina 29303

hereinafter referred to as "Agency", or its successors or assigns, the sum of _____ ($ ), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

**WHEREAS**, Contractor has by written agreement dated _____ entered into a contract with Agency to construct

State Project Name: Powers Building A-Wing

State Project Number: H59-6353-JM

Brief Description of Awarded Work: _____

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: Craig Gaulden Davis, LLC | PBK Architecture

Address: 19 Washington Park

Greenville, South Carolina 29601

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

**IN WITNESS WHEREOF**, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Labor & Material Payment Bond to be duly executed on its behalf by its authorized officer, agent or representative.

**DATED this** _____ **day of** _____**, 2**_____ *(shall be no earlier than Date of Contract)*

**BOND NUMBER** _____

| **CONTRACTOR** | **SURETY** |
|---|---|
| **By:** _____ **(Seal)** | **By:** _____ **(Seal)** |
| **Print Name:** _____ | **Print Name:** _____ |
| **Print Title:** _____ | **Print Title:** _____ *(Attach Power of Attorney)* |
| **Witness:** _____ | **Witness:** _____ |

*(Additional Signatures, if any, appear on attached page)*

# SE-357
# LABOR & MATERIAL PAYMENT BOND

**NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

**1**. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency to pay for all labor, materials and equipment required for use in the performance of the Contract, which is incorporated herein by reference.

**2**. With respect to the Agency, this obligation shall be null and void if the Contractor:

**2.1** Promptly makes payment, directly or indirectly, for all sums due Claimants; and

**2.2** Defends, indemnifies and holds harmless the Agency from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract.

**3**. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

**4.** With respect to Claimants, and subject to the provisions of Title 29, Chapter 5 and the provisions of §11-35-3030(2)(c) of the SC Code of Laws, as amended, the Surety's obligation under this Bond shall arise as follows:

**4.1** Every person who has furnished labor, material or rental equipment to the Contractor or its subcontractors for the work specified in the Contract, and who has not been paid in full therefore before the expiration of a period of ninety (90) days after the date on which the last of the labor was done or performed by him or material or rental equipment was furnished or supplied by him for which such claim is made, shall have the right to sue on the payment bond for the amount, or the balance thereof, unpaid at the time of institution of such suit and to prosecute such action for the sum or sums justly due him.

**4.2** A remote claimant shall have a right of action on the payment bond upon giving written notice by certified or registered mail to the Contractor within ninety (90) days from the date on which such person did or performed the last of the labor or furnished or supplied the last of the material or rental equipment upon which such claim is made.

**4.3** Every suit instituted upon a payment bond shall be brought in a court of competent jurisdiction for the county or circuit in which the construction contract was to be performed, but no such suit shall be commenced after the expiration of o ne year after the day on which the last of the labor was performed or material or rental equipment was supplied by the person bringing suit.

**5.** When the Claimant has satisfied the conditions of paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

**5.1** Send an answer to the Claimant, with a copy to the Agency, within sixty (60) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

**5.2** Pay or arrange for payment of any undisputed amounts.

**5.3** The Surety's failure to discharge its obligations under this paragraph 5 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a claim. However, if the Surety fails to discharge its obligations under this paragraph 5, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs to recover any sums found to be due and owing to the Claimant.

**6.** Amounts owed by the Agency to the Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the Contractor furnishing and the Agency accepting this Bond, they agree that all funds earned by the contractor in the performance of the Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Agency's prior right to use the funds for the completion of the Work.

**7**. The Surety shall not be liable to the Agency, Claimants or others for obligations of the Contractor that are unrelated to the Contract. The Agency shall not be liable for payment of any costs or expenses of any claimant under this bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

**8.** The Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

**9**. Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, the Agency or the contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

**10**. By the Contractor furnishing and the Agency accepting this Bond, they agree that this Bond has been furnished to comply with the statutory requirements of the South Carolina Code of Laws, as amended, and further, that any provision in this Bond conflicting with said statutory requirements shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

**11.** Upon request of any person or entity appearing to be a potential beneficiary of this bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

**12**. Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the laws of the State of South Carolina.

**13**. **DEFINITIONS**

**13.1** Claimant: An individual or entity having a direct contract with the Contractor or with a Subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the Contractor and the Contractor's Subcontractors, and all other items for which a mechanic's lien might otherwise be asserted.

**13.2** Remote Claimant: A person having a direct contractual relationship with a subcontractor of the Contractor or subcontractor, but no contractual relationship expressed or implied with the Contractor.

**13.3** Contract: The agreement between the Agency and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

**SE-380** **CHANGE ORDER NO.:**_____

# CHANGE ORDER TO DESIGN-BID-BUILD CONTRACT

**AGENCY:** Spartanburg Community College

**PROJECT NAME:** Powers Building A-Wing

**PROJECT NUMBER:** H59-6353-JM

**CONTRACTOR:** _____

**This Contract is changed as follows:** *(Insert description of change in space provided below.)*

**ADJUSTMENTS IN THE CONTRACT SUM:**

| | | | |
|---|---|---|---|
| 1. | **Original Contract Sum:** | | $ |
| 2. | **Change in Contract Sum by previously approved Change Orders:** | | |
| 3. | **Contract Sum prior to this Change Order:** | | $ 0.00 |
| 4. | **Amount of this Change Order:** | | |
| 5. | **New Contract Sum, including this Change Order:** | | $ 0.00 |

**ADJUSTMENTS IN THE CONTRACT TIME:**

| | | | |
|---|---|---|---|
| 1. | **Initial Date for Substantial Completion:** | | |
| 2. | **Sum of previously approved increases and decreases in Days:** | | Days |
| 3. | **Change in Days for this Change Order:** | | Days |
| 4. | **Total Number of Days added to this Contract including this Change Order:** | 0 Days | |
| 5. | **New Date for Substantial Completion:** | | |

**AGENCY ACCEPTANCE AND CERTIFICATION:**

I certify that the Agency has authorized, unencumbered funds available for obligation to this contract.

**BY:**_____ **Date:**_____

*(Signature of Representative)*

**Print Name of Representative:**_____

Change is within Agency Construction Contract Change Order Certification of: **$**_____ **Yes** ☐ **No** ☐

**APPROVED BY:**_____ **DATE:** _____

*(OSE Project Manager)*

**SUBMIT THE FOLLOWING TO OSE**

1. SE-380, completed and signed by the Agency.
2. SE-380, Page 2, completed and signed by the Contractor, A/E and Agency, with back-up information to support request.

**SE-380, Page 2** **CHANGE ORDER REQUEST NO.:**_____

# CHANGE ORDER REQUEST SUMMARY – DESIGN-BID-BUILD

**AGENCY:** Spartanburg Community College

**PROJECT NAME:** Powers Building A-Wing

**PROJECT NUMBER:** H59-6353-JM

**CONTRACTOR:** _____

**This Contract is requested to be changed as follows:** *(Insert description of change in space provided below.)*

**ADJUSTMENTS IN THE CONTRACT TIME:** Requested Change in Days for this Change Order:_____Days

| | | | (1) Contractor | (2) Subcontractor | (3) TOTAL |
|---|---|---|---|---|---|
| **Direct Costs** (Provide back-up, including hourly rates, invoices, manhours, etc.) | **1.** | Labor | | | |
| | **2.** | Materials (including Sales Tax) | | | |
| | **3.** | Rental Charges | | | |
| | **4.** | Subtotal Direct Costs (sum lines 1 – 3) | **$ 0.00** | **$ 0.00** | **$ 0.00** |
| **Contractor Markup** (per AIA A201, Section 7.1.5) | **5.** | Contractor OH&P (not to exceed 17% of line 4, col 1) | | | |
| | **6.** | Subcontractor's OH&P (not to exceed 17% of line 4, col 2) | | | |
| | **7.** | Contractor markup on Subcontractor (not to exceed 10% of line 4, col 2) | | | |
| | **8.** | Total Contractor Markup (sum lines 5 – 7) | **$ 0.00** | **$ 0.00** | **$ 0.00** |
| **Additional Bonding, Insurance and Permit Costs Associated with Change Order** | **9.** | Bonds | | | |
| | **10.** | Insurance | | | |
| | **11.** | Permits, Licenses or Fees | | | |
| | **12.** | Subtotal (sum lines 9 – 11) | **$ 0.00** | **$ 0.00** | **$ 0.00** |
| **TOTAL** | **13.** | Change Order Cost (sum lines 4, 8, 12, col 3) | | | **$ 0.00** |

**ADJUSTMENTS IN THE CONTRACT SUM:** Amount of this Change Order Request: **$**_____

**CONTRACTOR ACCEPTANCE:**

**BY:**_____ **Date:**_____
*(Signature of Representative)*

**Print Name of Representative:**_____

**A/E RECOMMENDATION FOR ACCEPTANCE:**

**BY:**_____ **Date:**_____
*(Signature of Representative)*

**Print Name of Representative:** David L. Dixon, AIA

**AGENCY ACCEPTANCE:**

**BY:**_____ **Date:**_____
*(Signature of Representative)*

**Print Name of Representative:**_____

**Instruction to Contractor:** Attach documentation as needed to justify the requested change to the contract and submit to A/E or Agency.

**SECTION 00 01 07.1 - SEALS PAGE - ARCHITECT**

**PART 1 GENERAL**

**1.1 DESIGN PROFESSIONAL - ARCHITECT OF RECORD**

Name and License No.: David L. Dixon SC 3944
Firm Name: Craig Gaulden Davis
Firm Address: 19 Washington Park

Divisions 1 - 12 Sections except where indicated as prepared by other design professionals of record.

**INSERT PROFESSIONAL SEAL ABOVE**

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

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**SECTION 00 01 07.3 - SEALS PAGE - MECHANICAL / PLUMBING**

**PART 1 GENERAL**

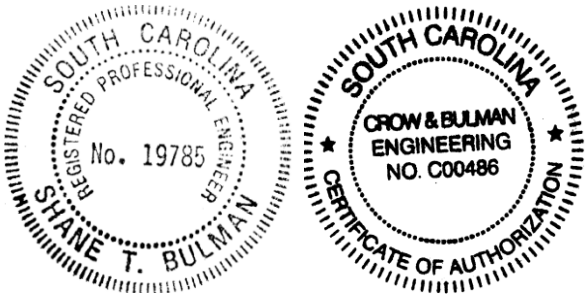
**1.1 DESIGN PROFESSIONAL - MECHANICAL / PLUMBING ENGINEER OF RECORD**

Name and License No.: Shane T. Bulman #19785

Firm Name: Crow & Bulman Engineering Inc.

Firm Address: 800 East Main St, Spartanburg, SC 293302

Divisions 22 and 23 Sections except where indicated as prepared by other design professionals of record.




**INSERT PROFESSIONAL SEAL ABOVE**

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

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**SECTION 00 01 07.4 - SEALS PAGE - ELECTRICAL**

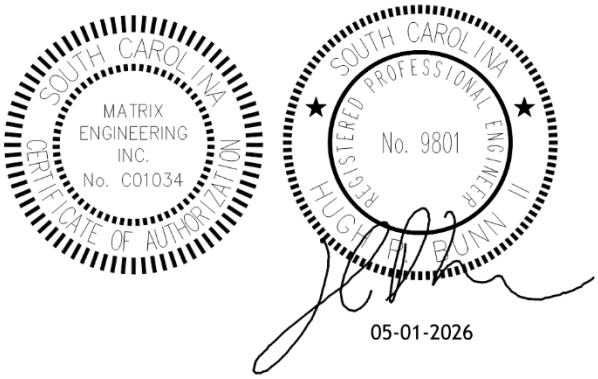
**PART 1 GENERAL**

**1.1 DESIGN PROFESSIONAL - ELECTRICAL ENGINEER OF RECORD**

Name and License No.: Hugh P. Bunn, PE License #9801

Firm Name: Matrix Engineering, Inc.

Firm Address: 912 South Pine Street, Spartanburg, SC 29302




Divisions 26 Sections except
where indicated as prepared by other
design professionals of record.

**INSERT PROFESSIONAL SEAL ABOVE**

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

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# SECTION 00 31 26.0 - EXISTING HAZARDOUS MATERIAL INFORMATION

## PART 1 - GENERAL

### 1.1 EXISTING HAZARDOUS MATERIAL 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 Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. An existing asbestos report for Project, prepared by Crossroads Environmental, LLC , dated April 10, 2026 , is available for viewing appended to this Document.

C. Related Requirements:
   1. Section 02 41 19 - Selective Demolition for notification requirements if materials suspected of containing hazardous materials are encountered.

## PART 2 PRODUCTS (NOT APPLICABLE)

## PART 3 EXECUTION (NOT APPLICABLE)

## END OF SECTION

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# SPECIFICATIONS FOR ASBESTOS ABATEMENT

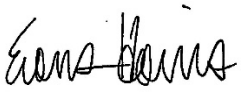
**CLIENT:**
**SPARTANBURG COMMUNITY COLLEGE**
**107 COMMUNITY COLLEGE DRIVE**
**SPARTANBURG, SC 29303**

**SITE:**
**JACK A. POWERS BUILDING**
**A-WING HVAC UPFIT**

**CRE Project #: 26780-IN**

**Crossroads Environmental, LLC**
**1258 Boiling Springs Road**
**Spartanburg, SC 29303**
**(864) 541-8736**

Prepared by:



Evans Harris

PD#: PD-00149, Exp. 10/26

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**SPECIFICATIONS FOR ASBESTOS ABATEMENT**
**SCC JACK A. POWERS BUILDING, A-WING HVAC UPFIT**
**PROJECT DESIGN #: 26780-IN**

## I. PREFACE/GENERAL DESCRIPTION

The Building Owner or other representatives of the Building Owner shall not be held liable in any way for negligence, whereas it be intentional or unintentional on the part of the Contractor. The asbestos abatement activities are being performed prior to extensive renovation of the A-Wing in the Jack A. Powers Building on the Spartanburg Community College campus in Spartanburg, South Carolina.

## II. SCOPE OF WORK

The Contractor will be responsible for the abatement of all asbestos-containing materials to be disturbed as part of the HVAC Upfit Project in the A-Wing of the Jack A. Powers Building which include:

**HA01/02/03: Remnant black mastic under vinyl floor tile immediately adjacent unit ventilator(s). Please Note: Of the nine (9) bulk samples collected, only one sample reported remnant mastic. This was a spot left from a previous abatement, and is not expected to be an asbestos hazard/ issue as related to removal of unit ventilator and fan coil unit(s). If discovered during removal, abatement contractor may remove the remnant spots of mastic using a rag and solvent.**

**HA08: Brown duct mastic located on large HVAC ductwork within mechanical closets A10M & A26.**

**HA09: Located above drop ceilings throughout A-Wing on hot/cold water mainlines.**

**HA12: Unit ventilator and fan coil unit interior heat shield/panel texture material; located in fan coil and unit ventilators throughout A-Wing.**

## III. CONTRACTOR INFORMATION

### A. SUBMITTALS

Project documentation including insurance certificate (see insurance requirements), SC-DES Asbestos Abatement Contractor's License, personnel accreditations, and waste shipment records must be submitted to the

Building Owner's Representative. The contractor and personnel accreditations must be submitted prior to project start up; waste shipment records to the Building Owner within 30 days after completion of the project.

**B. NOTIFICATIONS/LICENSES**

The Contractor is responsible for notification to SC-DES and for paying all applicable fees.

Contractor is responsible for obtaining a City Business license, where applicable.

**C. OSHA**

It is the abatement contractor's responsibility to fulfill all Occupational Safety and Health Administration (OSHA) requirements under CFR 1926.1101 and all other safety requirements that may be required by the work site.

**D. PERSONNEL**

**GENERAL SUPERINTENDENT/SUPERVISOR:**

Provide a General Superintendent licensed in Asbestos work that is experienced in administration, environmental remediation, general contracting coordinating, including work practices, protective measures for building and personnel, disposal procedures, etc. This person is responsible for compliance with all applicable federal, state, and local regulations, particularly those relating to asbestos-containing materials as outlined in OSHA 29 CFR 1926.1101, and 1926.20 through 1926.32. The Superintendent needs to be knowledgeable of the South Carolina Department of Health and Environmental Control Asbestos Regulation 61 61-86.1: Standards of Performance for Asbestos Projects, Effective May 27, 2011 and EPA NESHAP 61.140 Subpart M-National Emission Standard for Asbestos.

Experience and Training: The General Superintendent must be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C (ASHARA) and be licensed as a SCDHEC Asbestos Supervisor.

The General Superintendent must be on site at all times, and must be able to communicate in the language of Regulatory Personnel.

**ASBESTOS SUPERVISOR(S):**

Provide full time Supervisor(s) for inside the asbestos work area with experience in asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. One inside supervisor must be able to communicate in the language of the workers and be able to communicate in English to the Building Owner's Representative(s) and/or state regulatory personnel. All inside supervisor(s) are responsible for compliance with all applicable federal, state, and local regulations, particularly those relating to asbestos-containing materials as outlined in OSHA 29 CFR 1926.1101, and including 1926.20 through 1926.32. The Supervisor(s) need to be knowledgeable of the South Carolina Department of Health and Environmental Control Asbestos Regulation 61 61-86.1: Standards of Performance for Asbestos Projects, Effective May 27, 2011 and EPA NESHAP 61.140 Subpart M-National Emission Standard for Asbestos.

Experience and Training: The Asbestos Supervisor(s) (competent person) must be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C (ASHARA) and be licensed as SC-DES Supervisors.

**NON-SUPERVISORY PERSONNEL:**

Provide an adequate number of qualified personnel to meet the schedule requirements of the project.

Experience and Training: All workers employed for abatement throughout the project shall be accredited as an Asbestos Abatement Worker in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C (ASHARA) and be licensed as SC-DES Asbestos Workers.

**EVERY ASBESTOS ABATEMENT ENTITY PERFORMING WORK MUST HAVE HIS/HER ORIGINAL LICENSE, AS WELL AS A COPY OF HIS/HER MOST CURRENT TRAINING CERTIFICATE ON SITE AT ALL TIMES. HAVING THE LICENSE/CERTIFICATE IN A VEHICLE IS NOT ACCEPTABLE.**

**E. POWER & WATER**

Power and water will be provided by the Building Owner. The Contractor will be responsible for hoses, connectors, power cords, etc.

**F. SANITARY FACILITIES:**

Contractor to confirm with Building Owner if an on-site bathroom will be designated for their use. If not, the Contractor will be responsible for providing portable(s) toilets for their employees throughout the project.

Contractor is to follow OSHA Regulation 29 (CFR1926.51 (c)) "Toilets at construction jobsites."

**G. SUMMARY OF TASKS:**

Contractor shall remove and dispose of all asbestos-containing materials to be impacted by renovation activities as indicated in the specifications for **Jack A. Powers Building, A-Wing.**

Contract work includes:

1. Pre-abatement activities including pre-construction meeting, inspection, notifications, permits, submittal approvals, preparations, emergency arrangements, and submittal of plan of action.
2. Abatement activities including preparation of work site, removal and disposal of asbestos containing and/or contaminated waste, recordkeeping, security of job site, pre-work and post-work inspections, and OSHA compliance air monitoring.
3. Cleaning, Decontaminating, and Clearance activities including final inspection, clearance testing, certification of decontamination, and all post work submittals.
4. Any equipment that is unable to be moved must be poly'ed and protected during abatement.

**H. STOP WORK:**

If the Building Owner or Owner's Representative verbally issues a stop work order, the abatement contractor shall immediately and automatically stop all work and initiate fiber reduction activities. Do not resume asbestos removal until authorized by the Building Owner or the Owner's Representative. Do not recommence work until authorized by the Building Owner or the Owner's Representative. Standby time and cost required for corrective action will be at the contractor's expense. The occurrence of the following events shall be reported in writing to the Owner's Representative and shall require the contractor to immediately stop asbestos removal and initiate fiber reduction and other appropriate activities:

1. Excessive airborne fibers outside the containment area (>0.01 f/cc or established background levels, whichever is greater).
2. Break in either the primary or critical containment barriers.
3. Serious injury to a worker within the containment area that necessitates interruption of the normal decontamination procedures.
4. Presence of a fire and/or safety emergency.
5. Respiratory Protection System failure.

6. Power failure

## IV. PERSONAL PROTECTIVE EQUIPMENT

The following work practices must be employed during the abatement of the above materials accordingly:

### A. WORKER PROTECTION:

Before beginning work of this section provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

Protective Clothing:

Coveralls: Provide disposable full-body coveralls with head covers, and require that they be worn by all workers in the Work/Isolation Area. Provide a sufficient number for all required changes, for all workers in the Work/Isolation Area.

Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Do not allow boots to be removed from the Work/Isolation Area for any reason, after being contaminated with asbestos-containing material. Thoroughly clean, decontaminate and bag boots before removing them from Work/Isolation Area at the end of the work.

Hard Hats: Provide head protection (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Owner's Representative, Project Administrator, and Owner. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats with plastic strap type suspension. If hats are utilized in the Work/Isolation Area, thoroughly clean, decontaminate and bag hats before removing them from Work/Isolation Area at the end of the work.

Goggles: Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work/Isolation Area at the end of work.

### B. RESPIRATORY PROTECTION:

Description of Work:

Instruct and train each worker involved in asbestos abatement or maintenance and repair of Class I, II, and III asbestos-containing materials in proper respiratory use. Require that each worker always wear a respirator, properly fitted on the face in the Work/Isolation Area from the start of any operation which may cause airborne asbestos fibers until the Work/Isolation Area is completely decontaminated. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

Respiratory Protection Program: Comply with ANSI Z88.2 - 1992 "Practices for Respiratory Protection" and OSHA 29 CFR 1910.134 and CFR 1926.1101. Require that respiratory protection be used at all times where there is any possibility of disturbance of asbestos-containing materials whether intentional or accidental. Require that a respirator be worn by anyone in a Work/Isolation Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers until a negative exposure assessment has been completed.

General: The employer shall provide respirators, and ensure that they are used where required. Respirators shall be used in the following circumstances:

- During all Class I asbestos jobs.
- During all Class II work where the ACM is not removed in a substantially intact state.
- During all Class II and III asbestos jobs where the employer does not produce a "negative exposure assessment".
- During all Class III jobs where TSI or surfacing ACM or PACM is being disturbed.
- During all Class IV work performed within the regulated areas where employees performing other work are required to wear respirators.
- During all work where employees are exposed above the TWA (0.1 f/cc) or excursion limit (1.0 f/cc).

## V. PREPARATION OF THE REGULATED WORK AREA(S)

### A. REGULATED AREA DEMARCATION:

The Regulated area is the location where environmental remediation work occurs. All class I, II, and III asbestos work as defined in OSHA CFR 1926.1101 (b) shall be conducted within regulated areas.

All work areas where asbestos work or other contaminants are being removed must be demarcated with barrier tape and signs.
Access to the regulated area shall be limited to persons authorized in accordance with OSHA and SC-DES.

Prohibited activities within the regulated area include, but are not limited to: no eating, drinking, smoking, chewing of tobacco and gum, or applying of cosmetics. The competent person shall ensure that all asbestos work performed within regulated area is supervised by a competent person, which is defined in South Carolina as a licensed Supervisor.

**WORK/ISOLATION AREA:**

The Work/Isolation area that is located within the regulated area is a variable of the extent of work of the Contract. It may be a portion of a room, a single room, or a complex of rooms. A "Work/Isolation Area" is considered contaminated during the work, and must be separated from the balance of the building, and decontaminated at the completion of the asbestos-control work.

Completely separate the Work/Isolation Area from other parts of the building to prevent asbestos-containing dust or debris from passing beyond the work/isolated area. Should the area beyond the Work/Isolation Area(s) become contaminated with asbestos-containing dust or debris because of the work, clean those areas in accordance with the specifications. Perform all such required cleaning or decontamination at no additional cost to owner.

Place all tools, scaffolding, staging, etc. necessary for the work in the area to be separated prior to completion of Work/Isolation Area separation.

**CONTROL ACCESS:**

Provide Warning Signs at each access to the Regulated Area on doors and/or critical barriers. Post an approximately 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by OSHA 29 CFR 1926.1101:

**LEGEND:**

**DANGER**
**ASBESTOS**
**MAY CAUSE CANCER**
**CAUSES DAMAGE TO LUNGS**

**AUTHORIZED PERSONNEL ONLY**
**WEAR RESPIRATORY PROTECTION AND PROTECTION CLOTHING IN THIS AREA**

Provide spacing between respective lines at least equal to the height of the respective upper line.

**B. CRITICAL BARRIERS:**

Individually seal each opening between the work area and uncontaminated areas including windows, doorways, elevator openings, corridor entrances, drains, ducts, electrical outlets, grilles, grates, diffusers, and skylights with duct tape and a minimum of two (2) independent layers of polyethylene sheeting at least 6 millimeters (mil) in thickness taped securely in place. Seal all stationary equipment with a minimum of one (1) layer of polyethylene sheeting at least 4 mil in thickness. Maintain all seals until all work, including Project Decontamination, is complete and passing clearance results have been obtained.

**C. EQUIPMENT:**

The Contractor must ensure that all necessary equipment to perform the job efficiently is provided.

## VI. REMOVAL PROCEDURES

- **NON-FRIABLE REMOVAL TECHNIQUES FOR FLOOR TILE:**

  Non-friable removal techniques may be utilized in areas where the tile can be feasibly removed intact to prepare the work area for renovation and friable abatement.

  The work areas shall include critical barriers, splashguards, negative air machines to be used as air scrubbers, and decontamination unit (one-stage minimum). Continuously mist the work areas and floor tiles as necessary during the removal process. Remove binding strips or other restrictive molding from doorways, walls, etc. Clean and dispose of as non-asbestos waste. Dispose of any materials that have glue or floor mastic on them as asbestos-containing waste. Removal of the floor tiles should include the combination of infrared heat machines with flat shovels, or by the use of dry ice. Remove the tiles with minimum amount of breakage, and maintain the flooring material in a non-friable condition. Pick up whole tiles, stack, and place in labeled disposal bags or wrap in 2 layers of labeled poly. At the Contractor's option tiles may

be placed directly into durable leak-tight containers. Place bagged waste in a second disposal bag during decontamination.

**Please note that in the event that the flooring material becomes friable during the removal process, work will stop and all regulatory requirements regarding the removal of friable ACM will apply.**

- **NON-FRIABLE REMOVAL TECHNIQUES FOR FLOOR TILE MASTIC:**

Remove adhesive residue by using adhesive removal solvents. Provide a slow-drying solvent intended to remove tile adhesive. Provide material that is not flammable, is a low-odor solvent, and has no significant inhalation hazard. Provide materials that have no volatile organic solvents (VOCs) unless previously approved in writing by the Building Owner's Representative. Use solvents in accordance with manufacturers' instructions. Saturate adhesive with removal solvent, and allow adhesive to soften. Remove by scraping or wet sanding. Only manual methods may be utilized (no motorized buffers, sanders, etc.). Provide worker protection as required by material safety data sheet (MSDS) for any material used.

Start in the corner of the room farthest from the entrance door and moisten an area of the adhesive approximately 3 by 10 feet with amended water. Wet scrape with a stiff-bladed wall or floor scraper removing ridges and any loose adhesives until only a thin smooth film remains. Where deposits are heavy or difficult to scrape, heat with a hot-air blower prior to scraping. Deposit scrapings in a disposal bag or closed impermeable container and dispose of as required by the Disposal of Asbestos-Containing Waste Material. Keep floor wet with solvent or amended water. Wet vacuum standing water with HEPA wet/dry vacuum. Mop floor with amended water, removal encapsulant, or liquid detergent solution to remove all debris and residue. Mop floor with removal solvent as required by manufacturer's directions as required to completely remove all residue of adhesive.

Clean Floor after completion of removal of asbestos-containing materials by wet mopping with amended water. Mop at least three times or until all residue is no longer present, allowing a drying time between each mopping.

- **REMOVAL OF THERMAL SYSTEM INSULATION/TSI WRAP (GLOVEBAG METHOD):**

  Use glovebag procedures in compliance with federal and state regulations for the removal of small sections of TSI. Place a Primary Barrier of at least one layer of 6 mil polyethylene as a drop cloth below material to be removed extending at least 10 feet in all directions. Provide, at a minimum, 6 mil polyethylene, polyvinylchloride or equivalent plastic sack with two inward projecting long sleeved gloves or mittens, preprinted with same warning notice as a disposal bag, equipped with a pouch for storage of tools, with designated location for wand or HEPA vacuum wand, and sufficient capacity to hold removed materials and permit sealing as specified. Provide a hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or spray of liquid under pressure. Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two inches longer than the pipe diameter). Place necessary tools into pouch located inside glovebag. This will usually include at least the following items: bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and pre-wetted cloth. Place one strip of duct tape along the edge of the open top slit of glove bag for reinforcement. Place the glove bag around section of pipe to be worked on and staple top together through reinforcing duct tape. Next, duct tape the ends of glove bag to pipe itself, where previously covered with plastic or duct tape. Use smoke tube and aspirator bulb to test seal. Place tube into water sleeve (two-inch opening to glove bag) squeezing bulb and filling bag with visible smoke. Remove smoke tube and twist water sleeve closed. While holding the water sleeve tightly, gently squeeze glove bag and look for smoke leaking out, (especially at the top and ends of the glove bag). If leaks are found, tape closed using duct tape and re-test. Insert wand from garden sprayer through water sleeve. Duct tape water sleeve tightly around the wand to prevent leakage. Thoroughly wet material to be worked on with amended water or removal encapsulant and allow to soak in. Wet adequately to penetrate and soak material through to substrate. One person places his hands into the long-sleeved gloves while the second person directs garden sprayer at the work. Use bone saw, if required, to cut insulation at each end of the section to be removed. A bone saw is a serrated heavy gauge wire with ring-type handles at each end. Throughout this process, spray amended water or removal encapsulant on the cutting area to keep dust to a minimum. Remove insulation using putty knives or other tools. Place pieces in bottom of bag without dropping. Rinse all tools

with water inside the bag and place back into pouch. Using scrub brush, rags and water, scrub and wipe down the exposed pipe. Remove water wand from water sleeve and attach the small nozzle from HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag. Remove the vacuum nozzle, twist water sleeve closed and seal with duct tape. From outside the bag, pull the tool pouch away from the bag. Place duct tape over twisted portion and then cut the tool bag from the glove bag, cutting through the twisted/taped section. Contaminated tools may then be placed directly into next glove bag without cleaning. Alternatively, tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard rags and scrub brush with asbestos waste. With removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glove bag from the pipe. Slip a 6 mil disposal bag over the glove bag (still attached to the pipe). Remove tape or cut bag, open the top of the glove bag, and fold it down into disposal bag. Clean all surfaces in the Work Area using disposable cloths wetted with water with surfactant or removal encapsulant added. When the surfaces have dried, clean them with a HEPA filtered vacuum. Seal exposed ends of remaining pipe insulation and exposed pipe. Collapse the bag with a HEPA vacuum twist top of bag, seal with at least 3 wraps of duct tape, bend over, and seal again with at least 3 wraps of duct tape.

Dispose of all rags, plastic sheet, etc. in accordance with requirements "Disposal of Procedures".

Decontaminate Equipment: After the completion of all work, decontaminate all equipment and machinery used for work of this section.

- **REMOVAL OF UNIT VENTILATOR/FAN COIL TEXTURE HEAT SHIELD/PANEL (INTERIOR):**

Remove access door of unit ventilator/fan coil unit. Mist textured shield/panel materials with amended water so that entire surface is wet. During removal, ensure that there are no visible emissions of dust from the work area. Detach panel/shield and remove from unit ventilator. Do not cut, saw or abrade through textured material.

Wrap panel/shield in two (2) independent layers of 6-mil polyethylene sheeting.

Dispose of all rags, plastic sheet, etc. in accordance with requirements "Disposal of Procedures".

Decontaminate Equipment: After the completion of all work, decontaminate all equipment and machinery used for work of this section.

## VII. WASTE STORAGE AND DISPOSAL PROCEDURES

### ASBESTOS-CONTAINING MATERIALS (ACM)

All ACM waste materials are to be contained in one of the following: (1) Two 6 mil disposal bags, both bags twisted closed, folded over (gooseneck style), and both bags sealed with duct tape; (2) One 6 mil disposal bag, sealed as previously described placed into a durable leak-tight disposable container; (3) DOT-approved drum; (4) Two layers of 6-mil polyethylene sheeting sealed at seams with duct tape.

Waste stored on the site prior to disposal, must be maintained in a secured, locked location where access is controlled.

LABELING OF DISPOSAL CONTAINERS:
On the outside of the chosen disposal container, the following three labels must be placed and visible:

**First Label**: Provide in accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:
**Second Label**: Until October 1, 1993, provide in accordance with U. S. Department of Transportation regulation on hazardous waste marking. 49 CFR Parts 171 and 172. Hazardous Substances: Final Rule. Published November 21, 1986 and revised February 17, 1987:
**Third Label**: Provide in accordance with 40 CFR Part 61 (AMENDED), subpart M, section 61.150(a)(1)(v) of EPA's National Emission Standards for Hazardous Air Pollutants; Asbestos NESHAP Provision. Published November 20, 1990.

All waste is to be hauled by a waste hauler with all required licenses from all state and local authorities with jurisdiction. Protect walls, floors, and ceilings of the interior of the truck or dumpster with one layer of 6 mil polyethylene sheeting. Floor sheeting shall be installed first and shall extend up the side wall at least 12 inches and taped securely into place. Wall sheeting shall overlap by at least six inches and be taped into place. Ceiling sheeting shall extend down the sides of the walls at least six inches and be

taped into place. Take containers from the Work Area directly to a sealed truck or dumpster. Do not transport disposal bagged materials on open trucks. Comply with any local or state regulations for prior notice and delivery, and comply with any special landfill requirements.

At a disposal site, vehicles shall approach the dump location as closely as possible for unloading of the asbestos waste. Bags, drums and wrapped components shall be inspected when unloaded at the disposal site. Material in damaged containers shall be re-wrapped or re-packed in empty bags or drums. If more than 25% of the bags are broken or damaged, return to work site for re-bagging. Waste containers shall be placed on the ground at the disposal site, not pushed or thrown out. Following the removal of all containerized waste, polyethylene sheeting shall be removed and discarded in bags or drums along with contaminated cleaning materials and protective clothing. Clean cargo area of the truck or dumpster by wet-wiping with amended water and/or using a HEPA vacuum cleaner.

Retain Waste Shipment Records (WSRs) from landfill and/or processor for materials disposed of. At completion of hauling and disposal of each load submit copy of waste manifest and landfill receipts to Owner's Representative and comply with local and state regulations for disposal documentation.

As per NESHAPS 61.150 vii(3)(4) waste shipment records shall be obtained from the landfill/or hauler within 35 days, if not received within 45 days, EPA shall be notified by the contractor of unresponsive records.

## VIII. AIR MONITORING & PROJECT COMPLETION

A qualified and licensed air monitoring firm shall provide all air monitoring and perform all visual inspections.

**BACKGROUND AIR MONITORING:**

Background monitoring shall be performed both inside and outside of the work areas to establish existing ambient air levels under normal activity conditions. The background samples will be analyzed using Phase Contrast Microscopy (PCM) analysis.

**DAILY AREA AIR MONITORING**:

The purpose of the Owner's daily area air monitoring is to evaluate quality, resolve problems, and minimize the potential for the spread of contamination beyond the work area. In addition, the work of the Owner's IH includes performance of the final visual inspection and testing to

determine whether a space or a building has been adequately decontaminated. All daily air monitoring is to be done utilizing Phase Contrast Microscopy (PCM) except for Final Clearance Monitoring as specified in the following paragraphs. Owner's Air Monitor will perform the following tasks:

1. Perform continuous air monitoring, inspection and testing inside and outside the work area during actual abatement work to detect any faults in the work area isolation and any adverse impact on surrounding areas from work area activities

2. Perform final inspection and testing of decontaminated areas or buildings at the conclusion of the abatement and clean-up work to certify compliance with decontamination standard.

All data, inspection results, and testing results generated by the Owner's IH will be available to the contractor for information and consideration. Contractor shall provide cooperation and support to the Owner's IH for efficient and smooth performance of their work.

Monitoring and inspection results of the IH may be used to issue any stop removal orders to the contractor during abatement work and to accept or reject an area or a building as decontaminated.

This section also sets forth airborne fiber levels both inside and outside the work area as action levels, and describes the action required by the Contractor if an action level is met or exceeded.

**STOP ACTION LEVELS:**

Inside Work Area: Maintain an average airborne count in the work area of less than .05 f/cc. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. If the Time Weighted Average (TWA) fiber count for any work shift or 8-hour period exceeds the Stop Action Level, stop all work except corrective action, leave pressure differential and air circulation system in operation and notify Owner's Representative. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Owner's Representative.

If airborne fiber counts exceed 0.1 f/cc cease all work except corrective action. Notify Owner's Representative. Do not recommence work other

than corrective action for 24 hours unless otherwise authorized, in writing, by Owner's Representative.

Outside Work Area: If any air sample taken outside of the Work Area exceeds 0.01 f/cc or the base line established by background air monitoring, immediately and automatically stop all work except corrective action. The Owner's Representative will determine the source of the high reading and notify the Contractor in writing.

If the high reading was the result of a failure of Work Area isolation measures initiate the following actions:

- Immediately erect new critical barriers to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (eg. wall, ceiling, floor).

- Decontaminate the affected area in accordance with Project Decontamination Procedures.

- Require that respiratory protection as set forth in Respiratory Protection be worn in affected area until area is cleared for re-occupancy in accordance with Final Clearance Monitoring.

- Leave Critical Barriers in place until completion of work and ensure that the operation of the pressure differential system in the Work Area results in a flow of air from the affected area into the existing Work Area.

- If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a separate decontamination facility consisting of a Shower Room and Changing Room.

- After Certification of Visual Inspection in the Work Area, remove critical barriers separating the work area from the affected area. Final air samples will be taken within the entire area as set forth in Final Clearance Monitoring.

If the high fiber reading was the result of other causes, initiate the corrective action as determined by the Owner's Representative.

**CONTRACTOR RELEASE CRITERIA FOR FINAL WORK AREA CLEARANCE:**

**1) VISUAL INSPECTION**

Final Clearance Monitoring will not begin until the Asbestos Abatement Work Area airborne asbestos structure concentrations have been reduced to the level specified and described in Project Decontamination is complete, the area has passed a thorough visual inspection by the Owner's Air Monitor and the Project Manager and successful completion of these requirements has been certified by the Owner's Air Monitor and Project Manager. The visual inspection will be performed at the request of the Supervisor following fine cleaning of the work area.

**2) ENCAPSULATION**

A coating of compatible encapsulant must be applied to porous surfaces that have been stripped and cleaned of ACM. This must be compatible with the substrate of the replacement material.

**3) REMOVAL OF PRIMARY BARRIERS**

After all encapsulant is thoroughly dry, all primary barriers, if present, must be removed. If any evidence of contamination is observed after removal of the primary barriers, the debris/particulate should be HEPA vacuumed and wet-wiped under not residue remains.

**4) FINAL AIR MONITORING**

**LABORATORY TESTING AND ANALYTICAL METHODS:**

**PHASE CONTRAST MICROSCOPY (PCM):**

Analysis of background and daily samples will be performed utilizing the methods set forth in NIOSH 7400 method.

**SAMPLE VOLUMES:**

The number and volume of air samples taken by the Owner will be in accordance with all regulations and standards governing air monitoring. Additional samples may be taken at Owner's or Owner's Representatives discretion. If airborne fiber counts exceed allowed limits additional samples will be taken as necessary to monitor fiber levels.

**SAMPLE CASSETTES**:

PCM: Samples will be collected on 25 mm cassettes with a 0.80 micrometer mixed cellulose ester filter.

TEM: Samples will be collected on 25 mm cassettes with 0.45 micrometer mixed cellulose ester filter.

**WRITTEN REPORTS:**
Written reports will be posted at the job site on a daily basis, and within 24 hours of collection of the samples. Location will be determined by Owner's Representative and Contractor's General Superintendent. Clearance results shall be posted at the site prior to tear-down of the containment area(s).

**ADDITIONAL TESTING:**
The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner.

If clearance samples do not meet clearance criteria, Contractor will be responsible for reimbursement to County for air monitoring and samples cost for re-test.

**PERSONAL MONITORING:**
Contractor is responsible for performing air monitoring to meet Contractor's OSHA requirements for personnel sampling or any other purpose.

## IX. SUBMITTALS

The list below includes the submittal requirements prior to the start of work, and before project closeout. Submittal for the section At Project Closeout must be submitted to the Owner's Representative with the Final Payment Request.

**SUBMITTAL CHECKLIST - MANDATORY**

Submittal for section Before Start of Work must be turned in to the Owner or the Owner's Representative at the Pre-Construction Meeting. If no Pre-Construction Meeting is held, then the paperwork must be submitted to the Owner's or the Owner's Representative Office 48 Hours before the start of work. The Owner or Owner's Representative will then give the contractor written permission to begin work. The Contractor will not begin work without written permission.

**BEFORE START OF WORK**

_____1. Copy of Contractor's SC-DES Contractor's License.
_____2. Copies of SC-DES Licenses for each individual that will be working on the job site.
_____3. SC-DES Permit
_____4. Insurance Certificate

Submittal for the section Periodically During Work or Before Project Closeout must be submitted to the Owner or Owner's Representative with the Progressive Payment Request. If Progressive Payments are not indicated, then the submittals must be turned into the Owner or Owner's Representative Office before the Project Closeout. Contractor must have written permission from Owner or Owner's Representative before beginning Project Closeout.

**PERIODICALLY DURING WORK OR BEFORE PROJECT CLOSEOUT**

_____ 5. Copy of containment checklist filled out by Air Monitor and Contractor
_____ 6. Daily Logs filled out and signed by the Project Supervisor
_____ 7. Daily Sign In\Sign Out Sheets
_____ 8. Contractor's copy of Initial Exposure Assessment
_____ 9. Contractor's copy of Negative Exposure Assessment
_____ 10. Contractor's copy of Daily Air Monitoring Results
_____ 11. Accident and Incident Investigation Report
_____ 12. Visitor Log and signed Visitor's Authorization Form
_____ 13. Documentation of Manometer Readings and Asbestos Filtration (AFD) and Water Filtration (WFD) Device Inspections
_____14. Personnel Air monitoring reports

Submittal for the section At Project Closeout must be submitted with the Final Payment Request.

**AT PROJECT CLOSEOUT**

_____ 15. Certification of Removal
_____ 16. Asbestos Chain-of-Custody Form (Trip Ticket) completed by and signed by the Contractor Representative, Transporter and Disposal Site Representative within 35 days as required by NESHAPS 61.150 vii(3)(4)

Copies of the submittals for the section Items to be Submitted by the Air Monitoring Firm should also be obtained by the Contractor and included in the Contractor Submittals as indicated above.

**ITEMS TO BE SUBMITTED BY THE AIR MONITORING FIRM(S)**

_____ 17. Air monitoring reports posted within 24 hours
_____18. Summary to owner within 5 days
_____19. Copy of Air Monitor's license(s)

# SECTION 01 10 00 - SUMMARY

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Requirements including, but not limited to:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Type of Contract.
   4. Work by Owner and under separate contracts.
   5. Access to site.
   6. Coordination with occupants.
   7. Work restrictions.
   8. Construction and sequencing scheduling.
   9. Protection of work and adjacent property.
   10. Owner occupancy.
   11. Specification and Drawing conventions.
   12. Construction Schedule.

### 1.3 PROJECT INFORMATION

A. Project Name: Powers Building - A Wing Renovation

B. Project Location: 131 Community College Drive, Spartanburg, SC.

C. Owner: Spartanburg Comminity College

D. Architect: Craig Gaulden Davis | PBK Architects, Inc.

E. Consultants:
   1. Structural Engineer: Bailey & Son Engineering
   2. Mechanical Engineer: Crow & Bulman Engineering, Inc.
   3. Electrical Engineer: Matrix Engineering, Inc.

F. Project Description: The project consists of a final phase of renovations to the Powers Building, an academic classroom. The scope of work includes selective demolition of existing suspended ceilings, HVAC, and electrical components; minor hazardous material abatement; finish flooring repairs and partial replacement; replacement of suspended ceilings; new toilet partitions, base cabinets and counter tops, restroom sinks; and new mechanical and lighting systems for an area of approximately 18,000 square feet.

### 1.4 WORK COVERED BY THE CONTRACT DOCUMENTS

A. Contract Documents: Contract documents are defined in the General Conditions of the Contract, and include the following:
   1. Drawings as listed on Index.
   2. Specification Sections as listed on Table of Contents in Project Manual.
   3. All addenda issued prior to Bid Opening

### 1.5 TYPE OF CONTRACT

A. Project will be constructed under a General Contractor.

### 1.6 ACCESS TO SITE

A. Use of Site: Limit use of Project site to Work in areas and areas within the Contract limits indicated. Do not disturb portions of site beyond areas in which the Work is indicated.

1. Limits:
   a. Drawings indicate the limits of the construction operations.
2. Driveways, Walkways, and Entrances: Keep driveways, parking areas, drop off points, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, students, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
   a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Construction access path, contractor parking area(s), dumpster locations, temporary office location, and material storage/staging areas are to be provided as indicated on the construction drawings or if not shown, shall be approved by the Facilities Operations Representative with input from the School staff in advance of starting work. Construction access and facilities may not adversely impact school operations.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in weathertight condition throughout construction period. Repair damage caused by construction operations.

## 1.7 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and adjacent building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform Work to prevent interference with Owner's day to day operations. Maintain existing exits unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
   2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

B. Limited Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
   1. Architect shall prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
   2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
   3. Before limited Owner occupancy, ensure mechanical and electrical systems are fully operational, and required tests and inspections and start up procedures are successfully completed. On occupancy, Owner shall operate and maintain mechanical and electrical systems serving occupied portions of Work.
   4. Upon occupancy, Owner shall assume responsibility for maintenance and custodial service for occupied portions of Work.

## 1.8 WORK RESTRICTIONS

A. Work Restrictions: Comply with restrictions on construction operations. Comply with limitations on use of public streets and with other requirements of Authority Having Jurisdiction.

B. The School District publishes class times and school holidays on its web site. The Contractor must plan the work to avoid disrupting the District’s mission of teaching and learning. The Contractor shall schedule the work with the input of the site administrator and the Owner’s project representative and shall ensure that work activities coincide with the school’s schedule, including all after-hours or extra-curricular events. The School acknowledges that some activities may take

place during the normal school day which are not disruptive to teaching and learning, and which shall be approved in advance by the Facilities Operations Representative. The Contractor understands that he may be asked to stop any work activity during the normal school day if the activity proves to be a nuisance.

1. Disruptive activities include those which generate odor, vibration, dust or noise which can be heard in adjacent buildings.

C. On-Site Work Hours: Limit Work in the existing building to normal working hours, Monday through Friday, unless otherwise indicated. Coordinate with Owner when it is necessary to extend working hours or Work on weekends.

D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than two weeks in advance of proposed utility interruptions.
2. Obtain Owner’s written permission before proceeding with utility interruptions.

E. Work and storage areas are to be fenced with 6’ high temporary chain link fencing unless otherwise noted on these plans or approved in writing, in advance of construction. Temporary fencing and barricades are to be maintained through substantial completion. The Contractor is responsible to ensure that the work area is secure, and to ensure the safety of students and staff.

F. Provide a written request a minimum of eight (8) business days in advance when the work may impact occupancy and use of any facility, including systems noted above.

G. Work may not be performed, and materials may not be delivered to the job site during times when the Construction Superintendent is not on site. The Construction Superintendent is defined as a direct employee of the Contractor. This role may not be delegated to a subcontractor.

H. Communications: Construction Workers and delivery personnel are prohibited from communicating with staff and students at the job site. All communication is to be routed to the Design Professional or the Facilities Operations Representative. In the event of an emergency at the job site, the jobsite superintendent is to communicate the concern to the Site Administrator, and immediately contact the Facilities Operations Representative and Design Professional. Deliveries are to be made directly to the job site and signed for by the Construction Superintendent. Deliveries will not be accepted by the School's administrative staff. Where temporary barriers and partitions are shown separating the work area from the occupied areas of the building, they are to be constructed using nominal 2x4 wood studs with ½” plywood or ½” gypsum wallboard on the occupied side. Work limits and phasing of the Work, if applicable, is shown on the Drawings. Where multiple phases are required, the Contractor is required to achieve substantial completion of the preceding phase prior to beginning the next phase unless otherwise noted. Work areas are to be secured at the end of each work day and made safe for occupancy prior to the next school day.

I. Noise, Vibration, and Odors: Coordinate operations that result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two weeks in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

J. Any work that must be done outside of the designated construction area or phase limit in order to accomplish the Work of the project or phase of the project must have prior written approval from the Owner’s project representative and must be scheduled so as to avoid disrupting the Owner’s operations.

K. Controlled Substances, Firearms, and Explosive Devices: Use of tobacco products, controlled substances, firearms, and explosive devices on the site is not permitted.

L. Employee Identification: Provide identification tags for Contractor personnel working on site. Require personnel to use identification tags at all times.

M. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on site.
   1. Maintain list of approved screened personnel with ..

## 1.9 CONSTRUCTION AND SEQUENCE SCHEDULING

A. Generally, in order to accommodate the uninterrupted operation of the existing facility during the various phases of construction, the sequence of construction operations shall be as follows:
   1. Make necessary provisions to allow the occupied portions of the facility to function during construction, including provisions for temporary utilities, temporary walkways, erection of temporary barricades and fencing, and the like.
   2. Complete and turn over for occupancy the project or portions of the project, as phased. Unless otherwise specified or specifically approved during construction, work of subsequent phases cannot begin prior to substantial completion of the previous phase.
   3. Upon final completion, Owner acceptance of the project.

B. Some overlapping of construction operations may occur, and where necessary the Contractor may request permission to start certain portions of the work before the previous operations are completed in their entirety. Such detailed scheduling shall be done as the work progresses, provided that the Owner’s operations remain uninterrupted, but in all cases must receive Owner approval.

C. Where it is not possible to complete certain mechanical and electrical services to make the work complete and ready for occupancy, temporary services may be approved to permit occupancy by the Owner at the earliest possible date.

D. Detailed construction scheduling is the responsibility of the Contractor.

## 1.10 PROTECTION OF WORK AND ADJACENT PROPERTY

A. Buildings and adjacent areas may be subject to damage due to construction operations. At the Completion of the project, the Contractor shall restore existing buildings, landscaping, turf, parking facilities, sidewalks, etc., to the same or better condition as prior to the start of the work.

B. In addition to requirements of the General Conditions of the Contract for Construction, the Contractor shall:
   1. Notify, in writing, the Facilities Operations Representative when equipment or property interferes with the Work and arrange for disposition of such property.
   2. Provide coverings over inlets, area drains, drywells, etc. to prevent soil and construction debris from running into the storm system. In the event of a failure of a covering, the Contractor is required to clean the affected piping and structure(s) prior to substantial completion.
   3. Provide protection from rain, wind, and extreme temperatures to protect new work, materials, equipment, fixtures and adjacent areas from damage.
   4. Provide protection against stormwater back-ups when the storm system is affected by the work. Maintain flows as needed to avoid damage to the work and to surrounding areas.
   5. Provide temporary protection around openings through and at floors, roofs and other openings.
   6. Per the Florida Trench Safety Act (ss. 553.60-553.64): Provide and maintain proper shoring and bracing for excavations to prevent collapse or other damage until they can be properly backfilled upon completion of the new work.

C. The Contractor is required to photograph existing conditions related to existing conditions and to provide photographs in electronic format to the Design Professional and Facilities Operations Representative a minimum of 7 days prior to starting work on site. Sufficient photos with adequate detail to thoroughly document existing conditions shall be provided.

### 1.11 OWNER OCCUPANCY

A. The Owner reserves the right to occupy and to install equipment in completed areas of the building prior to Substantial completion, provided that such occupancy does not interfere with completion of the work. Such occupancy shall not constitute acceptance of the work.

B. Upon Substantial Completion of the project or portions thereof, the Owner will take occupancy. The Contractor is required to adjust work hours as needed in occupied areas so as to avoid disrupting Owners operations.
   1. Access to the facility and work area will be controlled by the Owner beginning at Substantial Completion. Refer also to the Close Out Procedures section.

### 1.12 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: Specifications use certain conventions for style of language and intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Imperative mood and streamlined language are generally used in Specifications. The words "shall," "shall be," or "shall comply with," depending on context, are implied where a colon (:) is used within a sentence or phrase.
   2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of each Specification section.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in Specifications. One or more of the following are used on Drawings to identify materials and products:
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
   2. Abbreviations: Materials and products are identified by abbreviations.

## PART 2 PRODUCTS (NOT APPLICABLE)

## PART 3 EXECUTION

### 3.1 CONSTRUCTION SCHEDULE

A. Owner has a critical need for the Work to begin upon Notice to Proceed and shall be Substantially Complete by as agreed to in the Contract. There will be no Extensions of Time due to weather except in cases of extreme weather (hurricane, tornado, etc.). The impact of each extreme weather event on schedule shall be discussed by the Architect, Owner, and Contractor.

**END OF SECTION**

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# SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. Schedule of values.

B. Applications for progress payments.

C. Application at time of substantial completion.

D. Final payment application.

E. Payment for stored materials.

F. Substantiating data.

G. Application for final payment.

H. Defect Assessment.

### 1.2 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

B. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
   1. Application for Payment forms with continuation sheets.
   2. Submittal schedule.
   3. Items required to be indicated as separate activities in general contractor's construction schedule.

C. Submit Schedule of Values in duplicate within 10 days after date of Owner-Contractor Agreement.

D. Subschedules of Values
   1. Subschedules: Provide subschedules in a form of submittal shall parallel that of the Schedule of Values, with each item identified the same as the line item in the Schedule of Values.
      a. The unit values for the materials shall be broken down into:
      b. Cost of the material delivered and unloaded at the site, with taxes paid.
      c. Installation costs, including general contractor's overhead and profit.
   2. Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
   3. 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.
   4. Unit Costs: Submit a Sub-schedule of unit cost and quantities for products on which progress payments will be requested for stored products.
      a. The unit quantity for bulk materials shall include an allowance for normal waste.The installed unit value, multiplied by the quantity listed, shall equal the cost of that item in the Schedule of Values.

E. Format and Content:
   1. 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 and one line for each product listed in the Summary section where applicable.
      a. When the project contains more than one facility or school, provide a full breakdown for each facility/school with the total of each facility/school added together to equal the base bids.
         1) Breakdown for each facility/school shall include labor, material, allowances, etc., as indicated below

b. Identification: Include the following Project identification on the schedule of values:
   1) Project name and location.
   2) Name of Architect.
   3) Architect's project number.
   4) general contractor's name and address.
   5) Date of submittal.

c. Arrange schedule of values consistent with format of AIA Document G703 or general contractor's form as approved by the Architect.

d. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
   1) Related Specification Section or Division.
   2) Description of the Work.
   3) Change Orders (numbers) that affect value.
   4) Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      (a) Labor.
      (b) Materials.
      (c) Equipment.

e. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
   1) Include separate line items under general contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.

f. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

F. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

G. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

H. Revise schedule to list approved Change Orders, with each Application For Payment.

## 1.3 APPLICATIONS FOR PROGRESS PAYMENTS

A. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
   1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
   1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
   2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. When Architect finds Application properly completed and correct, he will transmit Certificate for Payment to Owner. Incorrect or incomplete Certificates will not be reviewed until they have been corrected and resubmitted by the Contractor.

G. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored on site, but not yet installed. Differentiate between items stored on-site and items stored off-site.
   1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
   2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
   3. Provide summary documentation for stored materials indicating the following:
      a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
      b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
      c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

H. Transmittal: Submit four (4) 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.

I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit conditional final or full waivers.
   3. 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.
   4. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.

J. 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. Submittal schedule (preliminary if not final).
   6. List of Contractor's staff assignments.
   7. List of Contractor's principal consultants.
   8. Copies of building permits.
   9. Report of preconstruction conference.
   10. Certificates of insurance and insurance policies
   11. .Performance and payment bonds.
   12. Data needed to acquire Owner's insurance.

K. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
   3. Administrative actions and submittals that shall proceed or coincide with this application include:
      a. Occupancy permits and similar approvals.
      b. Warranties (guarantees) and maintenance agreements.
      c. Test/adjust/balance records.
      d. Maintenance instructions.
      e. Meter readings.
      f. Start-up performance reports.
      g. Change-over information, including door lock change over, related to Owner's occupancy, use, operation and maintenance.
      h. Final cleaning.
      i. Application for reduction of retainage and consent of surety.
      j. Advice on shifting insurance coverage.
      k. Final progress photographs.
      l. List of incomplete work, recognized as exceptions to Architect's Certificate of Substantial Completion.
   4. After the Certificate of Substantial Completion has been executed by all parties concerned and before payment is made the Contractor shall submit the following documents:
      a. Submit CONSENT OF SURETY TO FINAL REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE, A.I.A. Document G707A, if not previously submitted.

L. 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.AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
   4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
   5. AIA Document G707, "Consent of Surety to Final Payment."
   6. Evidence that claims have been settled.
   7. Final meter readings for utilities and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
   8. Final liquidated damages settlement statement.
   9. Four (4) signed and notarized original copies and noted as Final 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.
   10. Final schedule of values.
   11. Power of attorney from Surety for release of final payment, signed and sealed and dated same as Consent of Surety.
   12. Certificate of Contract Completion:
   13. Page one completed by the general contractor, submit original plus three copies.
   14. Page two completed by the Architect, submit original plus three copies.

15. general contractor's certification letter for the Guarantee of Construction for one year from substantial completion.
16. Copy of the approval and verification of transmittal by the general contractor to the Architect of manuals, shop drawings, as builts (one set of sepias and two sets prints), brochures, warranties and list of subcontractors with telephone numbers and addresses.
17. Verification that the owner's personnel have been trained in the operation of their new equipment (HVAC, controls, fire alarm, etc.) with list of attendees at each training section.
18. Fully executed warranties in the name of the owner.Architect's Certificate of Specification of Asbestos Containing Materials.
19. general contractor's Certificate of Asbestos Use.
20. Copy of Certificate of Occupancy.

M. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

**1.4 APPLICATION AT TIME OF SUBSTANTIAL COMPLETION**

A. See Supplemental and General Conditions for principal administrative actions and submittals which must precede or coincide with such special applications.

**1.5 FINAL PAYMENT APPLICATION**

A. See General Conditions, Supplemental Conditions and Closeout Submittals and Procedures for principal administrative actions and submittals which must precede or coincide with such special applications.

**1.6 PAYMENT FOR STORED MATERIAL**

A. Payment for stored items will be subject to prior approval by the Owner.
   1. On-Site Materials: Progress payments may be made for permanent materials and equipment to be incorporated in the work if approved in advance and properly stored on the project site.
   2. Off-Site Materials: Progress payments may be made for permanent, pre-fabricated materials or specially designed equipment to be incorporated into the work if approved in advance per terms of General Conditions and stored in accordance with manufacturer's instructions.

B. Proof of Need: With payment request for stored material, submit a copy of purchase order and payment voucher clearly identifying the material, specification reference, contract number and price. The following additional documentation may be included.
   1. Notarized certification of payment from supplier.
   2. Copy of canceled check to supplier.
   3. Lien release from supplier.
   4. Copy of insurance as required by General Conditions.

C. Verification of Price and Payment: The Contractor shall demonstrate that the costs of materials have been paid and will establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest including applicable insurance and transportation for those items stored off-site.

D. Partial payment for materials and equipment in advance of installation shall not constitute acceptance thereof and will not relieve Contractor of full responsibility for condition and subsequent acceptance by the Owner. Faulty materials discovered will be rejected even though partial payment may have been made.

**1.7 SUBSTANTIATING DATA**

A. When Architect / Engineer requires substantiating information, submit data within three working days, justifying line item amounts in question.

**1.8 MODIFICATION PROCEDURES**

A. Refer to section 012600 - Contract Modification Procedures.

B. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor on a Supplemental Instruction form - "SI".

C. For other required changes, Architect will issue a document signed by Owner instructing to proceed with the change, for subsequent inclusion in a Change Order for signatures of parties as provided in the Conditions of the Contract on State Field Authorization Form - "FA".
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change in Work.

D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within a timely manner. A change order proposal will be issued by the Architect for signatures of parties as provided in the Conditions of the Contract on State Change Order Proposal Form - "COP".

E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
   3. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

F. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

### 1.9 APPLICATION FOR FINAL PAYMENT

A. See Supplemental and General Conditions for principal administrative actions and submittals which must precede or coincide with such special applications.

### 1.10 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Architect, it is not practical to remove and/or replace the Work at the time of application for payment, the Architect will direct one of the following remedies:
   1. The defective Work may remain, but the unit sum/price will be reduced (50%) or an amount at the discretion of the Architect.
   2. The defective Work will be partially repaired to the instructions of the Architect, and the unit sum/price will be adjusted to a new sum/price at the discretion of the Architect.

C. The authority of the Architect to assess the defect and identify payment adjustment, is final.

D. Reduction of the amount requested in the "application for payment" does not constitute Owner's acceptance of the Work or release the Contractor from his obligation to complete and/or correct the work before the next application for payment unless specifically agreed by the Architect and processed via a Change Order.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION - NOT USED

**END OF SECTION**

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# SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

### 1.3 REFERENCE STANDARDS

A. AIA G709 - Proposal Request; 2018.

### 1.4 REFERENCES

A. Refer to specification Section 014100 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 MINOR CHANGES IN WORK

A. Architect will issue Architectural Supplemental Instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions".

### 1.6 ARCHITECTURAL SUPPLEMENTAL CHANGES

A. Architect will issue Architectural Supplemental Instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

B. In the event a change in Contract Sum or Contract Time is required by the general contractor, he shall so inform the Architect in writing within one (1) week of receipt of Supplemental Instruction or Clarification. A subsequent Proposal Request and Change Order will be issued prior to the general contractor proceeding with the work unless a specific cost and/or time change has been agreed to and authorization to proceed is included in the Supplemental Instruction or is subsequently issued.

C. Architect will sign and date the Supplemental Instruction or Clarification as authorization for the Contractor to proceed with changes.

D. general contractor will sign and date the Supplemental Instruction to indicate agreement with the terms therein and return to the Architect.

### 1.7 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 twenty (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.
   3. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   5. Include costs of labor and supervision directly attributable to the change.

6. 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.
7. Proposal Requests are not valid until Architect and Owner approve in writing. Upon approval the Proposal Request will be incorporated into a Contingency Adjustment Authorization.
8. Quotation Form:
   a. Use AIA G709 – “Proposal Request” Owner’s form.

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 costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in specification section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Requests are not valid until Architect and Owner approve in writing. Upon approval the Proposal Request will be incorporated into a Contingency Adjustment Authorization.
8. Proposal Request Form:
   a. Use AIA G709 – “Proposal Request”.

## 1.8 ADMINISTRATIVE CHANGE ORDERS

A. Masonry Veneer Adjustment: See Section 04 26 13 - Masonry Veneer for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of work.

## 1.9 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714 – “Construction Change Directive” instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

## 1.10 CHANGE ORDER PROCEDURES

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

B. Change Order will constitute authorization to proceed with additions and deletions as defined by Proposal Request.

C. Change Order will provide an accounting of the adjustment in the Contract Sum and/or Contract Time.

D. Content of Change Order will be based on either:
   1. Architect's Proposal Request and Contractor's responsive Proposal as mutually agreed between Owner and Contractor.
   2. Contractor's Proposal for a change as recommended by Architect.
   3. Owner authorized Construction Change Directive as mutually agreed between Owner and Contractor and recommended by Architect.
   4. Executed Architect's Supplemental Instructions.

E. Owner will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

F. Contractor will sign and date the Change Order to indicate agreement with the terms therein.

### 1.11 CORRELATION WITH CONTRACTOR'S SUBMITTAL

A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of work, and to record the adjusted Contract Sum. Submit along with Applications for Payment.

B. Periodically revise the Construction Schedule to reflect each change in Contract Time:
   1. Revise schedules to show changes for other items of work affected by the changes.
   2. Submit revised Schedule to Architect and Owner; submit revised schedules to sub-contractors of other work affected by the changes.

### 1.12 EXECUTION OF CONSTRUCTION CHANGE DIRECTIVES AND PROPOSAL REQUESTS

A. general contractor shall, upon receipt of either document, proceed in a timely fashion to execute the documents and incorporate required items into the project when so indicated. Execute documents within two (2) weeks.

B. general contractor shall inform all affected trades immediately upon receipt of above mentioned documents and receive written indication of either no change in Contract Price, or a fully itemized breakdown of costs to be incurred. Price breakdowns shall be documented as indicated.

## PART 2 PRODUCTS (NOT APPLICABLE)

## PART 3 EXECUTION

### 3.1 EXECUTION OF CONSTRUCTION CHANGE DIRECTIVES AND PROPOSAL REQUESTS

A. general contractor shall, upon receipt of either document, proceed in a timely fashion to execute the documents and incorporate required items into the project when so indicated. Execute documents within two (2) weeks.

B. general contractor shall inform all affected trades immediately upon receipt of above mentioned documents and receive written indication of either no change in Contract Price, or a fully itemized breakdown of costs to be incurred. Price breakdowns shall be documented as indicated.

**END OF SECTION**

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# SECTION 01 30 00.0 - ADMINISTRATIVE REQUIREMENTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. General coordination procedures.

B. General administrative requirements.

C. Information submittals.

D. Project site use plan.

E. Electronic document submittal service.

F. Preconstruction meeting.

G. Progress meetings.

H. Preinstallation conferences.

I. Construction progress schedule.

J. Contractor's daily reports.

K. Progress photographs.

L. Coordination drawings.

M. Requests for Interpretation (RFI) procedures.

N. Submittal schedule.

O. Submittals for review, information, and project closeout.

P. Number of copies of submittals.

Q. Submittal review.

### 1.3 REFERENCE STANDARDS

A. AIA G716 - Request for Information; 2004.

B. AIA G810 - Transmittal Letter; 2001.

C. CSI/CSC Form 12.1A - Submittal Transmittal; Current Edition.

D. CSI/CSC Form 13.2A - Request for Information; Current Edition.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

B. 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.

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

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

## 1.6 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Architect:
1. Requests for Interpretation (RFI).
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

## 1.7 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within fifteen (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 e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in temporary field office. Keep list current at all times.

### 1.8 PROJECT USE SITE PLAN

A. The general contractor shall prepare a proposed project use of the site plan.

B. general contractor shall confine operations at the site to areas within the areas indicated and as approved on the use of the site plan, and as permitted by law, ordinances, and permits. Site shall not be unreasonably encumbered with materials, products, or construction equipment.

C. The general contractor in reviewing his use of the site shall include access to proposed building for construction purposed, storage of materials and products, parking, where possible, for employees, temporary facilities including offices, storage, and workshop sheds or portable trailers, and unloading space.

D. Where a temporary fence is to be provided, the general contractor shall show any additional area needed in the general 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.

## PART 2 PRODUCTS (NOT APPLICABLE)

## PART 3 EXECUTION

### 3.1 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in allowable format.
   4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
   5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

C. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

### 3.2 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three (3) days of the meeting.

B. Preconstruction Conference:
1. Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 10 days after Notice to proceed.
2. Conduct the conference to review responsibilities and personnel assignments.
3. Attendance Required:
   a. Owner
   b. Architect.
   c. Contractor.
4. Agenda:
   a. Execution of Owner-Contractor Agreement.
   b. Submission of executed bonds and insurance certificates.
   c. Distribution of Contract Documents.
   d. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   e. Designation of personnel representing the parties to Contract and Architect.
   f. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   g. Scheduling.
5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

C. Progress Meetings:
1. Schedule and administer meetings throughout progress of the work at Project Site unless otherwise indicated.
   a. Attendance Required:
      1) Contractor.
      2) Owner.
      3) Architect.
      4) Contractor's superintendent.
      5) Major subcontractors.
   b. Agenda:
      1) Review minutes of previous meetings.
      2) Review of work progress.
      3) Field observations, problems, and decisions.
      4) Identification of problems that impede, or will impede, planned progress.
      5) Review of submittals schedule and status of submittals.
      6) Maintenance of progress schedule.
      7) Corrective measures to regain projected schedules.
      8) Planned progress during succeeding work period.
      9) Maintenance of quality and work standards.
      10) Effect of proposed changes on progress schedule and coordination.
      11) Other business relating to work.
   c. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 60 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, Commissioning Authority, general contractor, Architect, and their consultants; general contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
   3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
      a. Preparation of record documents.
      b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
      c. Submittal of written warranties.
      d. Requirements for preparing operations and maintenance data.
      e. Requirements for delivery of material samples, attic stock, and spare parts.
      f. Requirements for demonstration and training.
      g. Preparation of general contractor's punch list.
      h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
      i. Submittal procedures.
      j. Coordination of separate contracts.
      k. Owner's partial occupancy requirements.
      l. Installation of Owner's furniture, fixtures, and equipment.
      m. Responsibility for removing temporary facilities and controls.
      n. Requirements for completing sustainable design documentation.
   4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at weekly, biweekly, monthly intervals.
   1. Coordinate dates of meetings with preparation of payment requests.
   2. Attendees: In addition to representatives of Commissioning Authority, general contractor and Architect, 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. general 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 general 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) Status of sustainable design documentation.
         5) Deliveries.

6) Off-site fabrication.
7) Access.
8) Site utilization.
9) Temporary facilities and controls.
10) Progress cleaning.
11) Quality and work standards.
12) Status of correction of deficient items.
13) Status of RFIs.
14) Status of proposal requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.
19) Tracking logs.

c. Schedule Updating: Revise general 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.

### 3.3 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

### 3.4 DAILY CONSTRUCTION REPORTS

A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.

B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
1. Date.
2. High and low temperatures, and general weather conditions.
3. List of subcontractors at Project site.
4. List of separate contractors at Project site.
5. Approximate count of personnel at Project site.
   a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
6. Major equipment at Project site.
7. Material deliveries.
8. Safety, environmental, or industrial relations incidents.
9. Meetings and significant decisions.
10. Unusual events (submit a separate special report).
11. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
12. Directives and requests of authority having jurisdiction (AHJ).

13. Testing and/or inspections performed.
14. List of verbal instruction given by Owner and/or Architect.
15. Signature of Contractor's authorized representative.

### 3.5 PROGRESS PHOTOGRAPHS

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.

C. Photography Type: Digital; electronic files.

D. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.

E. Views:
   1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
   2. Consult with Architect for instructions on views required.
   3. Provide factual presentation.
   4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
   5. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
      a. File Naming: Include project identification, date and time of view, and view identification.

### 3.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
      a. Use applicable drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
      b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
      c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
      e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
      f. Indicate required installation sequences.
      g. Indicate dimensions shown on 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.

B. Coordination Drawing Organization: Organize coordination drawings as follows:
   1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
   2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on drawings. Indicate areas of conflict between light fixtures and other components.
   3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
   4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
   5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
   6. Mechanical and Plumbing Work: Show the following:
      a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
      b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts, and electrical distribution equipment.
      c. Fire-rated enclosures around ductwork.
   7. Electrical Work: Show the following:
      a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
      b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
      c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
      d. Location of pull boxes and junction boxes, dimensioned from column center lines.
   8. Fire-Protection System: Show the following:
      a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
   9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
   10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in this Section.

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
   1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
   2. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
   3. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
      a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to drawings.
      b. Contractor shall execute a waiver agreement using the "Digital Data Release Form" included in this section, prior to release of digital files.

### 3.7 REQUESTS FOR INTERPRETATION (RFI)

A. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
   2. Prepare in a format and with content acceptable to Owner.

C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
   2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
      c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
      d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
   3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
   4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
      a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.

D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.
   5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
   6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
   7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

F. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Indicate current status of every RFI. Update log promptly and on a regular basis.

G. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs

received after 12:00 noon will be considered as having been received on the following regular working day.

1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

## 3.8 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.

1. Coordinate with Contractor's construction schedule and schedule of values.
2. Format schedule to allow tracking of status of submittals throughout duration of construction.
3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
    a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.
5. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
6. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

## 3.9 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:

1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

### 3.10 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

### 3.11 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

### 3.12 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

### 3.13 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a single transmittal for related items.
   2. Transmit using approved form.
      a. Use Contractor's form, subject to prior approval by Architect.
   3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   6. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Send submittals in electronic format via email to Architect.
   7. Schedule submittals to expedite the Project, and coordinate submission of related items.

a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect's approval, allow an additional 30 days.

8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
9. Provide space for Contractor and Architect review stamps.
10. When revised for resubmission, identify all changes made since previous submission.
11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
13. Submittals not requested will not be recognized or processed.

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

**3.14 SUBMITTAL REVIEW**

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
a. "Approved", or language with same legal meaning.
b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
2) Non-responsive resubmittals may be rejected.
2. Not Authorizing fabrication, delivery, and installation:
a. "Revise and Resubmit".
1) Resubmit revised item, with review notations acknowledged and incorporated.
2) Non-responsive resubmittals may be rejected.

b. "Rejected".
1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
a. "Received" - to notify the Contractor that the submittal has been received for record only.
2. Items for which action was taken:
a. "Reviewed" - no further action is required from Contractor.

**END OF SECTION**

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# DIGITAL DATA RELEASE FORM

| | | | |
|---|---|---|---|
| **Project:** | Powers Building – A Wing<br>Spartanburg, SC | **Date:** | MM/DD/YYYY |
| **Project Number:** | 26010.00 | **Contractor:** | {Insert Contractor Name}<br>{Insert Contractor's Address}<br>{Insert Contractor's Address} |
| **Architect of Record:** | CGD \| PBK Architects<br>19 Washington Park<br>Greenville, SC 29601 | | |

Digital Data refers to electronic representation of information, drawings, and designs created and stored in digital form including Building Information Modeling (BIM) files, CAD files, and other formats that are digital representations of the project. PBK will provide the following {Revit / CAD} dated {MM/DD/YYYY} for the convenience of the Contractor after purchase of the building.

Digital Data were prepared on the following:

Computer Hardware/Operating System – {Microsoft Windows 10}
Software Application and Version – {type here}

Contractor shall pay PBK a service fee of $00.00.

## TERMS & CONDITIONS

1. PBK makes no representation as to the compatibility of the Digital Data with any hardware or software.
2. Since the information set forth on the Digital Data can be modified unintentionally or otherwise, PBK reserves the right to remove all indicia of its ownership and/or involvement from each electronic display.
3. All information on the digital data is considered Instruments of Service of PBK and shall not be used for other projects, for additions to this project, or completion of this project by others. The Digital Data shall remain the property of PBK and in no case shall the transfer of these files be considered a sale.
4. PBK makes no representation regarding the accuracy, completeness, or permanence of the Digital Data, or for their merchantability or fitness for a particular purpose. Addenda information or revisions made after the date indicated on the Digital Data may not have been incorporated. In the event of a conflict between PBK's sealed contract drawings and the Digital Data, the sealed contract drawings shall govern. It is the Contractor's responsibility to determine if any conflicts exist. The Digital Data shall not be considered to be Contract Documents as defined by the General Conditions of the Contract for Construction.
5. The use of Digital Data prepared by PBK shall not in any way obviate the Contractor's responsibility for the proper checking and coordination of dimensions, details, and quantities of materials as required to facilitate complete and accurate fabrication and erection.
6. The Contractor shall, to the fullest extent permitted by law, indemnify, defend, and hold harmless PBK and its consultants from all claims, damages, losses, expenses, penalties, and liabilities of any kind, including attorney's fees, arising out of or resulting from the use of the Digital Data by the Contractor, or by third party recipients of the Digital Data from the Contractor.
7. PBK believes that no licensing or copyright fees are due to others on account of the transfer of the Digital Data, but to the extent any are, the Contractor will pay the appropriate fees and hold PBK harmless from such claims.
8. Payment of the service fee is due upon receipt of the Digital Data.

| | |
|---|---|
| _____ | _____ |
| Name & Title (Architect) | Name & Title (Contractor) |
| _____ | _____ |
| Signature Date | Signature Date |

# SECTION 01 40 00 - QUALITY REQUIREMENTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve general contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit general contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for general contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, general contractor or authorities having jurisdiction are not limited by provisions of this Section.
   4. Specific test and inspection requirements are not specified in this Section.

B. Submittals.

C. Quality assurance.

D. References and standards.

E. Testing and inspection agencies and services.

F. Control of installation.

G. Tolerances.

H. Manufacturers' field services.

I. Defect Assessment.

J. Administrative and procedural requirements for quality assurance and quality control.

K. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve general contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit general contractor’s other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for general contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, general contractor, or authorities having jurisdiction are not limited by provisions of this Section.
   4. Specific test and inspection requirements are not specified in this Section.

### 1.3 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2023).

B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2026.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2025.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.

E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.

F. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.

G. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2025.

## 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

## 1.5 DEFINITIONS

A. Refer to Section 01 42 16 - Definitions for the following terms:
   1. Contractor's Quality Control Plan.
   2. Contractor's Professional Design Services.
      a. Design Services Types Required:
         1) Construction-Related.
         2) Design-Related.
   3. Design Data.
   4. Experienced.
   5. Source Quality-Control Testing.
   6. Field Quality-Control Testing.
   7. Installer/Applicator/Erector.
   8. Testing Agency.
   9. Pre-construction Testing.
   10. Product Testing.
   11. Quality-Assurance Services.
   12. Quality-Control Services.

## 1.6 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

## 1.7 SUBMITTALS

A. Shop Drawings:
   1. Provide plans, sections, elevations, and details indicating materials and size.
   2. Indicate manufacturer and model number of individual components.
   3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

## 1.8 INFORMATIONAL SUBMITTALS

A. general contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For general contractor's quality-control personnel.

C. general contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
   1. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. See Section 01 30 00.0 - Administrative Requirements, for submittal procedures.

## 1.9 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
   1. Date issued.
   2. Project title and number.
   3. Name of inspector.
   4. Date and time of sampling or inspection.
   5. Description of the Work and test and inspection method.
      a. Identification of product and specifications section.
   6. Location in the Project.
   7. Complete test or inspection data.
   8. Date of test/inspection.
   9. Results of test/inspection.
   10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
   11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
   12. Name and signature of laboratory inspector.
   13. Recommendations on retesting and reinspecting.
   14. Compliance with Contract Documents.
      a. When requested by Architect, provide interpretation of results.
   15. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of technical representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Statement that products at Project site comply with requirements.
   4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement whether conditions, products, and installation will affect warranty.
   7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of factory-authorized service representative making report.
   2. Statement that equipment complies with requirements.
   3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   4. Statement whether conditions, products, and installation will affect warranty.
   5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

F. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

G. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit report in duplicate within 30 days of observation to Architect for information.
   2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

## 1.10 GENERAL CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within ten (10) days of Notice to Proceed, and not less than five (5) days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out general contractor's quality-assurance and quality-control responsibilities. Coordinate with general contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
   1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
   1. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
   2. Owner-performed tests and inspections indicated in the Contract Documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

**1.11 QUALITY ASSURANCE**

A. Provide where required by Specifications.

B. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

C. 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.

D. 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.

E. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

F. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

G. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

H. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

I. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

K. Testing Agency Qualifications:
   1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

L. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a

Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

M. Contractor's Quality Control (CQC) Plan:
   1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
      a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.
         1) Include qualifications (in resume form), duties, responsibilities of each person assigned to CQC function.
      b. Management Approach: Define, describe, and include in the plan specific methodologies used in executing the work.
         1) Management and control of documents and records relating to quality.
         2) Communications.
         3) Coordination procedures.
         4) Resource management.
         5) Process control.
         6) Inspection and testing procedures and scheduling.
         7) Control of noncomplying work.
         8) Tracking deficiencies from identification, through acceptable corrective action, and verification.
         9) Control of testing and measuring equipment.
         10) Project materials certification.
         11) Managerial continuity and flexibility.
      c. Owner will not make a separate payment for providing and maintaining a Quality Control Plan. Include associated costs in Bid price.
      d. Acceptance of the plan is required prior to start of construction activities not including mobilization work. Owner's acceptance of the plan will be conditional and predicated on continuing satisfactory adherence to the plan. Owner reserves the right to require Contractor to make changes to the plan and operations, including removal of personnel, as necessary, to obtain specified quality of work results.

N. Quality-Control Personnel Qualifications. Engage a person with requisite training and experience to implement and manage quality assurance (QA) and quality control (QC) for the project.

**1.12 QUALITY CONTROL**

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
   2. Retesting and reinspection fees will be withheld from the contractor's pay application. It is not to be performed througha change order.

B. 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 "Administration Requirements."

C. 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.

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. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.

E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
   1. Access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   4. Facilities for storage and field curing of test samples.
   5. Delivery of samples to testing agencies.
   6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   7. Security and protection for samples and for testing and inspecting equipment at Project site.
   8. Provide a rain gauge on site acceptable to the testing agency and log daily rainfall. Copies of log shall be made to testing agency and local authorities upon demand.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

## 1.13 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

## 1.14 TESTING AND INSPECTION AGENCIES AND SERVICES

A. As indicated in individual specification sections, Owner shall employ and pay for services of an independent testing agency to perform specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION**

**3.1 CONTROL OF INSTALLATION**

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

**3.2 TOLERANCES**

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

**3.3 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.

**3.4 TESTING AND INSPECTION**

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   6. Perform additional tests and inspections required by Architect.
   7. Attend preconstruction meetings and progress meetings.
   8. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Contractor shall notify the testing/inspection firm a minimum of (2) two business days prior to test/inspection.
   5. Owner shall pay for all tests and inspections.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

F. Restesting and reinspection fees will be withheld from the contractor's pay application. It is not to be performed through a change order. No money shall flow from the contractor to the testing/inspection firm.

## 3.5 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

## 3.6 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

B. Protect construction exposed by or for quality-control service activities.

C. Replace Work or portions of the Work not complying with specified requirements.

**END OF SECTION**

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# SECTION 01 41 00 - REGULATORY REQUIREMENTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 CODE REQUIREMENTS

A. Perform all work on this Project in strict accordance with, but not limited to, applicable requirements and portions of the latest adopted editions of the currently adopted codes, revisions, amendments, supplements, and their references.

B. South Carolina governing codes:
   1. International Building Code (IBC) 2021 Edition.
   2. International Existing Building Code (IEBC) 2018 Edition.
   3. International Plumbing Code (IPC) 2021 Edition.
   4. International Mechanical Code (IMC) 2021 Edition.
   5. International Fire Code (IFC) 2021 Edition.
   6. National Electrical Code (NEC) 2020 Edition.
   7. Gas Fuel Code: International Fuel Gas Code (IFGC) 2021 Edition.
   8. Energy Code Standards:
      a. International Energy Conservation Code (IECC) 2009 Edition.
      b. Energy Standard for Buildings Except Low-Rise Residential Buildings - ASHRAE 90.1-2007.
   9. National Fire Protection Association:
      a. NFPA 80 – Standard for Fire Doors and Fire Windows.
      b. NFPA 70 - National Electric Code (NEC) 2020 Edition.
   10. Accessibility:
      a. U.S. Department of Justice, Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design.
      b. U.S. Access Board, Americans with Disabilities Act Architectural Guidelines (ADAAG), Accessibility Guidelines for Buildings and Facilities.
      c. U.S. Access Board, Americans with Disabilities Act Architectural Guidelines (ADAAG), accessibility requirements for children, July 23, 2004.
      d. Accessible and Usable Buildings and Facilities, ICC/ANSI A A117.1, 2017 Edition.
   11. American Society of Civil Engineers – ACSE 7:
      a. Minimum Design Loads for Buildings and Other Structures.
      b. Minimum Finished Floor Elevations: The Contractor shall furnish the county with a signed and sealed "Flood Elevation Certificate" certifying compliance of the finished floor elevations for all new construction.
      c. ASCE 7-16 Seismic Design Categories Reference Information, Seismic Design Category D (SDC D).
   12. South Carolina State Department of Education:
      a. Office of School Facilities (OSF) Guide 2025; South Carolina School Facilities Planning and Construction Guide.

### 1.3 CODE STANDARDS

A. All work shall conform to applicable portions of the adopted, or the latest edition of the standards listed, which shall include, but is not limited to, the following:
   1. Aluminum Association (AA).
   2. American Association of Automatic Door Manufacturers (AAADM).
   3. American Concrete Institute (ACI).

4. American Institute of Steel Construction (AISC).
5. American National Standards Institute (ANSI).
6. American Society for Testing and Materials (ASTM).
7. American Society of Mechanical Engineers (ASME).
8. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).
9. American Welding Society (AWS).
10. Architectural Woodworking Institute (AWI).
11. Architectural Aluminum Manufacturer's Association (AAMA).
12. Commercial Standards (CS).
13. Federal Specifications and Standards (FSS).
14. Global Standards: International Organization for Standardization (ISO); ISO 9001 -Quality Management Systems.
15. National Occupations Safety and Health Administration (OSHA).
16. National Institute for Standards and Technology (NIST).
17. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA), Metal Finishes Manual for Architectural and Metal Products.
18. Underwriter's Laboratories (UL).
19. U.S. of America Standards Institute (ASI).
20. U.S. Department of Commerce Product Standards (USDCPS).

**1.4 REFERENCE STANDARDS**

A. Comply with applicable portions of the Referenced Standards listed in the International Building Code.

**1.5 CODE DISCREPANCIES**

A. In case of discrepancy between the codes, standards, and specifications listed, the strictest or most stringent requirement shall govern.

**1.6 COMPLIANCE WITH CODES**

A. A permit issued will be construed as permission to proceed with construction, and not as authority to violate, cancel, alter, or set aside any of the provisions of any Codes.

B. Nor shall issuance of a permit prevent the Owner from thereafter requiring a correction of errors in plans, construction, or violations of any Codes.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

# SECTION 01 42 16 - DEFINITIONS

## PART 1 GENERAL

### 1.1 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."

**Activity:** A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

**Critical Activity:** An activity on the critical path that must start and finish on the planned early start and finish times.

**Predecessor Activity:** An activity that precedes another activity in the network.

Successor Activity: An activity that follows another activity in the network.

**Adequate Ventilation:** Ventilation, including air circulation and air changes, required for curing materials, dissipate humidity, and prevent accumulation of dust fumes, vapors, or gases.

**Adhesives:** All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

**AESS:** Refer to Architecturally-Exposed Structural Steel.

**Alteration Work:** Remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.

**Alternate:** An amount proposed by bidders and stated on the Bid Form for certain Work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

Alternates described are part of the Work when enumerated in the Agreement. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

**Anchorage Connector:** A component or subsystem that functions as an interface between the anchorage and a fall protection, work positioning, rope access, or rescue system for the purpose of coupling the system to the anchorage.

**Architecturally-Exposed Structural Steel (AESS):** Structural steel complying with designated AESS category as defined in AISC 303.

B.

**Basis of Design (BOD) (Document):** A document that records the concepts, calculations, decisions, and product selections used to meet the Owner’s Project Requirements and to satisfy applicable regulatory requirements, standards and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

**Basis of Design (BoD) (Product):** A product around which the project has been designed. If a product other than the Basis of Design is provided, it must be coordinated with Architect.

**Basis of Design Product Specification:** A specification in which a specific manufacturer's product is named and accompanied by the words "Basis of Design Product", including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in service performance, physical

properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

**Bio-Based Material:** Commercial or industrial products (other than food or feed) that are composed in whole, or in significant part, of biological products, renewable agricultural materials (including plant, animal, and marine materials), or forestry materials. For the purposes of LEED, this excludes leather and other animal hides.

C.

**Casework:** Products including, but not limited to framework, doors, drawers, hardware, and finishes which constitute cabinets and cases.

**Concealed:** Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches (762 mm) above finished floor.

**Exposed:** Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches (1.066 m) above finished floor, tops of cases less than 72 inches (1.82 m) above finished floor and all members visible in open cases or behind glass doors.

**Semi-Exposed:** Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches (1.828 m) above finished floor and bottoms of cabinets more than 30 inches (0.762 m) but less than 42 inches (1.066 m) above finished floor.

**Cast Stone:** Refined architectural concrete building unit manufactured to simulate natural cut stone, used in unit masonry applications.

**Dry Cast Concrete Products:** Manufactured from zero slump concrete:
Vibrant Dry Tamp (VDT) casting method - Vibratory ramming of earth moist, zero slump concrete against a rigid mold until densely compacted.

**Wet Cast Concrete Products:** Manufactured from measurable slump concrete:
Wet casting method - Manufactured from measurable slump concrete and vibrated into a mold until densely consolidated.

**Certified Wood:** Wood based materials and products certified in accordance with Forest Stewardship Council's (FSC) Principles and Criteria for wood building components.

**Chain-of-Custody Certificates:** Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001. Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body. A chain-of- custody certification is not required by distributors of a product that is individually labeled with the Forest Stewardship Council logo and manufacturer's chain of custody number. Chain of Custody certification requirements are determined by Forest Stewardship Council Chain of Custody Standard 40-004 v2-1.

**Clean:** Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

**Commissioning (Cx):** A systematic process confirming that building systems have been installed, properly started, and consistently operated in strict accordance with the Project Documents, that all systems are complete and functioning in accordance with the Contract Documents at Substantial Completion, and the Contractor has provided the Owner adequate system documentation and training.

**Commissioning Authority (CxA):** Party having a contractual agreement with the Owner to provide third party commissioning services as defined herein under Commissioning Authority's Role and Responsibilities. Commissioning Authority may represent the Owner and is authorized to act on behalf of the Owner. The Commissioning Authority does not have authority to alter design or installation procedures without the written approval of the Owner or the design team.

**Comparable Product:** Product demonstrated and approved through submittal process, or where indicated as a produce substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

Composite Materials: Materials made from two or more constituent materials with significantly different physical or chemical properties that, when combined, produce materials with characteristics different from the individual components.

**Composite Wood (also referred to as "Engineered Wood"):** Examples of Composite Wood are: particleboard; flake-board; plywood; fiberboard; MDF; agrifiber products; millwork substrates; flooring substrates; equipment backboards; door cores.

**Consolidate:** To strengthen loose or deteriorated materials in place.

**Construction Waste:** Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

**Contract Documents:** The General Conditions, Drawings, Specifications, Addenda, and other documents developed by the A/E Team and approved by the Owner that constitute the contractual obligations of the project scope.

**Control Point and Sensor Calibration Verification:** Process of verifying the point integrity and/or sensor calibration from the physical point of monitoring (sensor, contact, actuator, etc.) to the digital point location at the Operator's interface within the respective control system (Building Automation, Lighting Controls, Power Status and Monitoring, etc.).

**Cost Loading:** The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.

**Critical Path**: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

**Critical Path Method (CPM):** A method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

**Cutting:** Removal of existing construction necessary to permit installation or performance of other Work.

D.

**Deconstruct:** To remove by disassembling or detaching an item from a surface, using methods and equipment to successfully prevent damage to the item and surfaces, and dispose of items unless indicated as salvaged or for reinstallation.

**Deferred Testing:** Functional Performance or Integrated System Tests performed after Substantial Completion due to partial occupancy, partial equipment acceptance, seasonal requirements, design, or other site conditions that prohibit the test from being performed prior to Substantial Completion.

**Deficiency:** Condition of a component, piece of equipment, or system that is not in compliance with the Project Documents.

**Demolition Waste:** Building and site improvement materials resulting from demolition or selective demolition operations.

**Design Reference Sample:** A sample that represents the Architect's prebid selection of Work to be matched; it may be existing Work or Work specially produced for the Project.

**Directed:** A command or instruction by Architect. Other terms including "requested," "authorized", "selected", "required", and "permitted" have the same meaning as "directed."

**Dismantle:** To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

**Disposal:** Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

E.

**Engineered Wood:** Refer to Composite Wood.

**Equipment:** A product with operational parts, regardless of whether motorized or manually operated, and in particular, a product that requires service connections such as wiring or piping.

**Existing to Remain:** Leave existing items that are not scheduled for salvage or reuse, as is; do not remove.

**Experienced:** When used with an entity or individual, experienced means having successfully completed a minimum of five years documented experience with projects similar in nature, size, and extent; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

F.

1. **Fall Arrest System:** A system designed to stop you in the process of a fall, typically including an anchor point or series of anchor points, a safety lanyard or self-retracting lifeline, and a harness.
2. **Fall Protection System:** System can be either a fall arrest or a fall restraint system.
3. Fall Restraint System: A system designed to keep you from getting close enough to the fall hazard to fall, typically including an anchor point or series of anchor points, a safety lanyard or self-retracting lifeline, and a harness.
4. Fiber-Reinforced Polymer (FRP): Material that consists of polymer resin-based matrix with fibers of either glass, carbon or aramid, and hybrid combinations of these fiber types.

Field Quality Control Testing: Tests and inspections performed onsite for work scheduled to be performed and upon completed Work.

**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.

**Float:** The measure of leeway in starting and completing an activity.

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.

Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

**Formaldehyde:** Naturally occurring VOC, found in small amounts in animals and plants; carcinogenic and irritant to humans when present in high concentrations. (Levels above 0.1 ppm).

**Urea Formaldehyde:** Combination of urea and formaldehyde, used in glue, and readily decomposes at room temperature.

**Phenolformaldehyde:** Type of formaldehyde that off gasses only at high temperature; used for exterior products and suitable for interior applications.

**Functional Performance Test (FPT):** Test of dynamic function and operation of equipment and systems executed by the Contractor and witnessed by the CxA. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, life safety conditions, power failure, etc. Systems are operated through all specified sequences of operation. Components are verified to be responding in accordance with requirements in the Project Documents.

**Functional Performance Testing Procedures:** Commissioning protocols, detailed test procedures and instructions in tabular and script-type format that fully describe system configuration and steps required to determine if the system is performing and functioning properly.

**Furnish:** Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G.

**General Emissions Evaluation:** To comply with low-emitting material criteria, building products must be tested and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.2–2017mg/, using the applicable exposure scenario. Manufacturers' claims of compliance with the above requirements must also state the range of total VOCs after 14 days (336 hours), measured as specified in the CDPH Standard Method v1.2: 0.5 mg/m3 or less; between 0.5 and 5.0 mg/m3; or 5.0 mg/m3 or more.

H.

**Hazardous:** Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

**Hazardous Materials:** Material regulated as hazardous material in accordance with 49 CFR 173, requiring Material Safety Data Sheet (MSDS) in accordance with 29 CFR 1910.1200, or which during end use, treatment, handling, storage, transportation, or disposal meets or has components which meet or have the potential to meet the definition of a Hazardous Waste in accordance with 40 CFR 261. Hazardous material includes hazardous chemicals.

Hazardous materials include but are not limited to pesticides, biocides, and carcinogens listed by the Environmental Protection Agency (EPA) and International Agency for Research on Cancer (IARC) and recognized authorities.

I.

**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."

**Indoor Air Quality (IAQ):** Composition and characteristics of air in an enclosed space affecting occupants of space. The indoor air quality refers to relative quality of air in a building with respect to contaminants and hazards and is determined by levels of indoor air pollution and characteristics of air, including those that impact thermal comfort such as air temperature, relative humidity, and air speed.

**Informational Submittals:** Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1. **Integrated Systems Test (IST):** Test of dynamic function and operation of multiple systems. Integrated Systems Tests are tested under various modes, such as fire alarm and emergency situations, life safety conditions, power failure, etc. Systems are integrally operated through all specified sequences of operation. Systems and interconnections are verified to be responding in accordance with the requirements in the Project Documents.
2. **Integrated Systems Testing Procedures:** Commissioning protocols and detailed test procedures and instructions in tabular and script-type format that fully describe system configurations and steps required to determine if the interacting systems are performing and functioning properly.
3. **Interior Final Finishes:** Materials and products exposed at interior, occupied spaces including flooring, wallcovering, finish carpentry, and ceilings.
4. **Install:** Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
5. **Installer/Applicator/Erector:** Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular construction operations, including installation, erection, application, and similar operations.
6. **Interior (of Building):** Within the weatherproof membrane.

J.

N/A

K.

N/A

L.

**Lifeline:** A component of a fall protection system consisting of a flexible line designed to hang vertically, a vertical lifeline, or connecting to anchorages or anchorage connectors at both ends to span horizontally, a horizontal lifeline.
**Look-Ahead Schedule:** Prepare schedule indicating activities scheduled to occur or commence prior to submittal of next schedule update.

M.

**Match:** To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
**Materials:** Products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form units of work.
MERV: Minimum Efficiency Reporting Value: Arrestance rating of filter at three MERV Rating Explanation particle sizes of 0.3 microns to 10 microns at a determined face velocity.
**Milestones:** measurable and observable and serve as progress markers (flags) but, by definition, are independent of time (have zero durations) therefore no work or consumption of resources is associated with them.
**Millwork:** Ready-made wood products manufactured at a wood-planing mill or woodworking plant: moldings, doors, door frames, window sashes, stair work, cabinets, etc. excluding flooring, ceilings, and sidings.
**Mockups:** Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

**Laboratory Mockups:** Full-size physical assemblies constructed at testing facility to verify performance characteristics.
**Integrated Exterior Mockups:** Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
**Room Mockups:** Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

N.

**Non-Hazardous:** Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
**Non-Toxic:** Neither immediately poisonous to humans nor poisonous after a long period of exposure.

O.

**Operational Testing:** Activities and testing occurring after initial energizing and/or start-up of equipment that determine whether equipment is operating within the manufacturer's recommendations and the design requirements. These activities are intended to ensure that equipment and systems meet all warranty requirements and are ready for Functional Performance Testing. Common examples are Testing, Adjusting and Balancing of HVAC systems and initial load testing of electrical equipment.

**Owner's Designated Representative (ODR):**Owner's representative, or its duly authorized representative, who will provide the general administration of this Agreement for Projects on behalf of Owner and shall be Owner's field representative in all matters related to this Agreement, including keeping Owner's procurement personnel informed at all times of the adequacy of Supplier's performance and progress, except as may be otherwise provided herein. Owner may, at its sole discretion, change its Designated Representative at any time or from time to time, and shall promptly notify Supplier, in writing, of any such change.

**Owner's Project Requirements (OPR):** A written document that details the functional requirements of a project and the expectations of how the facility will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria and supporting information.

P.

**Packaged Dry Products:** Materials and products installed in dry form and delivered in manufacturer's packaging; including carpets, resilient flooring, ceiling tiles, and insulation.

**Patching:** Fitting and repair Work required to restore surfaces to original conditions after installation of other Work.

**Pencil Copy:** A preliminary review copy of the application for payment for review by Architect and Owner prior to submission of final copy.

**Permeable Surface:** Surfaces which allow storm water to pass through and infiltrate the soil below.

**Plastic Composites, or Wood-Plastic Composites:** Composite materials made primarily from wood- or cellulose-based materials and plastics.

**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.

**Project Documents:** Consists of the Contract Documents, Approved Submittals, Requests for Information (RFI), Vendor documentation, Operations and Maintenance (O&M) information and other documentation that determines the requirements for acceptable installation and operation of the specific equipment and systems on the project.

**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.

**Product:** Item 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", "assembly", and terms of similar intent.

**Comparable Product:** Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

**Named Product:** Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature current as of date of the Contract Documents.

**New Products:** Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

**Specified Product:** Same as Named Product.

**Provide:** Furnish and install, complete and ready for the intended use.

Q.

**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.

**Quality-Control Services:** Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

R.

**Recovery Schedule:** Submittal of a revised critical path method (CPM) schedule and a written plan.

**Recyclable:** Ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

**Recycle:** Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

**Recycled Content:** Defined in accordance with the International Organization of Standards document ISO 14021, Environmental labels and declarations, Self-declared environmental claims (Type II environmental labeling).

Postconsumer material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.

Preconsumer material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials, such as rework, regrind, or scrap, generated in a process and capable of being reclaimed within the same process that generated it.

**Recycling:** Process of sorting, cleansing, treating, and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

**Refinish:** To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

**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.

**Reinforced Masonry:** Masonry containing reinforcing steel in grouted cells.

**Remove:** Detach items from existing construction and dispose off-site unless indicated as salvaged or reinstallation.

**Repair:** To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

**Replace:** To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

**Replicate:** To reproduce in exact detail, materials, and finish unless otherwise indicated.

**Reproduce:** To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

**Request for interpretation (RFI):** A request seeking one of the following:

An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.

A resolution to an issue which has arisen due to field conditions and affects design intent.

**Resource Loading:** The allocation of manpower and equipment necessary for completion of an activity as scheduled.

**Retain:** To keep existing items that are not to be removed or dismantled.

**Return:** To give back reusable items or unused products to vendors for credit.

**Reuse:** To reuse a construction waste material in some manner on the project site.

S.

**Salvage:** Recovery of demolition or construction waste for subsequent sale or reuse.
**Salvage and Reuse:** Recovery of demolition or construction waste and subsequent incorporation into the Work.
**Schedule of Values:** A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
**Scheduling Specialist (SS):** An internal or third party entity contracted to the Owner providing scheduling advice (if applicable).
**Sealants:** All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
**Sediment:** Soil and other debris that has been eroded and transported by storm or well production run-off water.
**Source Separation:** Separating waste materials from the time they become waste.
**Start-Up:** The activities where equipment is initially energized, tested and operated. Start-up is completed prior to Operational Testing and Functional Performance Testing and is an integral item documented in the System Verification Checklist (SVC).
**Strip:** To remove existing finish down to base material unless otherwise indicated.
**Submittals:** Written and graphic information and physical samples that require Architect's responsive action or are for information and do not require the architect’s action.
**Substitutions:** Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

**Substitutions for Cause:** Proposed due to changed Project circumstances beyond Contractor's control such as unavailability or regulatory changes.
**Substitutions for Convenience:** Proposed due to possibility of offering substantial advantage to the Project

**Subsystem:** A portion of a system with characteristics similar to a system.
**System:** An organized collection of parts, equipment, or subsystems united by regular interaction.
**System Verification Checklist (SVC):** List of static inspections and material or component tests that verify proper installation of equipment (e.g., belt tension, oil levels, labels affixed, gages in place, sensors calibrated, etc.), start-up activities and documentation, as well as operational testing results. The checklists are meant to document all activities for an individual piece of equipment from procurement on the project through operational testing are performed in accordance with the requirements in the project documents.

T.

**Testing:**

**Field Quality Control Testing:** Tests and inspections performed on site for installation of the Work and for completed Work.
**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.
**Product Testing:** Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
**Source Quality Control Testing:** Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

**Testing Agency:** An independent entity engaged to perform specific inspections, tests, or both, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
**Testing Laboratory:** Refer to Testing Agency.

**Toxic:** Poisonous to humans either immediately or after a long period of exposure.
Training Plan: A detailed plan prepared by the Contractor and reviewed by the Owner and Commissioning Authority that outlines the training activities, instructors, time durations, and system requirements in accordance with the Contract Documents and Commissioning Plan.
**Trending:** Data collection of monitored points using the Building Automation System, Lighting Controls System, Power Status and Monitoring System or independent data acquisition instrumentation.

U.

N/A

V.

**Volatile Organic Compound (VOC):** A carbon compound that vaporizes at normal room temperatures.

W.

**Waste:** Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
**Wet Products:** Materials and products installed in wet form, including paints, sealants, adhesives, and special coatings.
**Wood-Plastic Composites:** Refer to Plastic Composites.

X.

N/A

Y.

N/A

Z.

N/A

**PART 2 PRODUCTS**

**NOT USED**

**PART 3 EXECUTION**

**NOT USED**

**END OF SECTION**

# SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 01, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.

B. Temporary utilities include, but are not limited to, the following:
   1. Water service and distribution.
   2. Temporary electric power and light.
   3. Temporary heat.
   4. Ventilation.
   5. Sanitary facilities, including drinking water.
   6. Storm and sanitary sewer.

C. Support facilities include, but are not limited to, the following:
   1. Field offices and storage sheds.
   2. Temporary roads and paving.
   3. Dewatering facilities and drains.
   4. Temporary enclosures.
   5. Temporary project identification signs and bulletin boards.
   6. Waste disposal services.
   7. Rodent and pest control.
   8. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities include, but are not limited to, the following:
   1. Temporary fire protection.
   2. Barricades, warning signs, and lights.
   3. Sidewalk bridge or enclosure fence for the site.
   4. Environmental protection.

### 1.3 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
   1. Implementation and Termination Schedule: Within 15 days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

### 1.6 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
   1. Building code requirements.

2. Health and safety regulations.
3. Utility company regulations.
4. Police, fire department, and rescue squad rules.
5. Environmental protection regulations.

B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

### 1.7 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
1. Verify with Owner how Use Charges will be paid.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

C. Verify with Owner if Educational Facilities Inspector’s (EFI) Trailer is required for Project. Provide location and access in accordance with Owner’s requirements.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Architect/Owner, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended. These materials shall not create unsafe conditions, and shall not violate requirements of applicable codes and standards.

B. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."
1. For job-built temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sizes and thicknesses indicated.
3. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch- (16-mm-) thick exterior plywood.

C. Gypsum Wallboard: Provide gypsum wallboard on interior walls of temporary offices.

D. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary offices, shops, and sheds.

E. Paint: Comply with requirements of Sections 09 91 13 - "Exterior Painting" and 09 91 23 - "Interior Painting."
1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
3. For interior walls of temporary offices, provide 2 coats interior latex-flat wall paint.

F. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

G. Water: Provide potable water approved by local health authorities.

H. Open-Mesh Fencing: Provide 0.120-inch (3-mm-) thick, galvanized 2-inch (50-mm) chainlink fabric fencing 6 feet (2 m) high with galvanized barbed-wire top strand and galvanized steel pipe posts, 1 1/2 inches (38 mm) I.D. for line posts and 2 1/2 inches (64 mm) I.D. for corner posts.

I. All temporary facilities of any type shall comply with all O.S.H.A. requirements. The Contractor is solely responsible for compliance.

**2.2 EQUIPMENT**

A. General: Provide new equipment. If acceptable to the Architect, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

B. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30 m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

1. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

E. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

F. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

G. Provide an additional office trailer for exclusive use by the Owner.

H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. 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 SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.
   1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 feet of building lines. Comply with requirements of NFPA 241.

C. Field Offices: Provide insulated, weathertight temporary offices, minimum size of 10’ x 14’, of sufficient size to accommodate required office personnel, Owners/Architects/Engineers at the Project Site. Provide a separate trailer for the Owner’s exclusive use. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
   1. Furnish with (2) desks and (4) chairs, a 4-drawer lockable file cabinet, plan table, plan rack, a 6-shelf bookcase, four (4) duplex outlet, separate telephone lines with two (2) hand sets and adequate lighting.
   2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
   3. Maintain temporary structures, offices, and storage in a safe and sanitary condition at all times during construction. Do not violate any local codes or ordinances regarding these facilities.

D. Storage and Fabrication Sheds: Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.

E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
   1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
   2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. or less with plywood or similar materials.
   3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
   4. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

F. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor.
2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

B. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

C. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

## 3.4 ACCESS ROADS AND PARKING AREAS

A. On-Site Roads and Parking Areas:
1. Locate road, drives, walks and parking facilities to provide uninterrupted access to construction offices, mobilization, work, storage areas, and other areas required for execution of the Contract.
2. Provide access for emergency vehicles.
3. Maintain driveways a minimum of 15 feet wide between and around combustible materials in storage and mobilization areas.
4. Maintain traffic areas free as possible of excavated materials, construction equipment, products and debris.
5. Keep fire hydrants and water control valves free from obstruction and accessible for use.

## 3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary

facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

**END OF SECTION**

# SECTION 01 56 00 - TEMPORARY BARRIERS AND ENCLOSURES

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References, are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Temporary jobsite protection including the following:
   1. Door jamb protection.
   2. Small project floor and wall protection.
   3. Seaming tape for floor protection.
   4. Recyclable, portable jobsite trash containers.

### 1.3 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.4 ACTION SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for submittal procedures.

C. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

### 1.5 QUALITY ASSURANCE

A. Manufacturer: Minimum Five (5) years’ experience manufacturing similar products.

### 1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handle materials to avoid damage.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Manufacturer and basis of design shall be the following. However, products of other manufacturers will be considered for acceptance, provided they equal or exceed the material requirements and functional qualities of the specified product, and acceptance is provided by the Architect in writing prior to bidding.
   1. Ram Board.

B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product:
   1. Surface Shields.
   2. Trimaco, Inc.

### 2.2 TEMPORARY FLOOR AND WALL PROTECTION

A. Temporary protection board shall comply with the following requirements, as necessary for the use.
   1. Materials:
   2. Fold lines allowing corner, horizontal and vertical wall protection.

a. Wall guard fold lines at 4 inches (101 mm), 8 inches (203 mm) and 12 inches (305 mm) from edge of board.

3. Allow protected substrates and finishes to cure while being protected.
4. Protection against water, paint, mud, and more.

B. Protection Boards:
1. Basis of Design Products as manufactured by Ram Board.
a. Heavy Duty Temporary and Reusable Floor and Wall Protection: Model #RB 38-100.
b. Pre-Taped Board: Ram Board Plus Model #RB PLUS 38-100.
c. Reusable Protection for Small Projects: Home Edition Model #RBHE 36-50.
d. Painter's Board: Ram Board Painter's Board Model #20RB 35-50.

## 2.3 DOOR JAMB PROTECTION

A. Door Jamb Protection: Heavy-duty flexible re-usable door jamb protection.
1. Materials: Recycled and recyclable materials.
2. Door Jamb Sizes: Fits 4 inches – 9 inches (102 mm – 229 mm).
3. Basis of Design Product: Model # RBJP 60, or RBJP 36 Ram Jamb, as manufactured by Ram Board.

## 2.4 SEAMING AND EDGE TAPES FOR FLOOR PROTECTION

A. Seaming Tape: Used to cover Ram Board seams.
1. Backing: Unique kraft backing tears easily and creates an extremely durable, smooth finish.
2. Basis of Design Product: Model #RT 3-164, as manufactured by Ram Board.

B. Vapor-Cure Tape: Used to cover Ram Board seams which prevents tape lines.
1. Performance: Allows vapors and moisture to escape from concrete, glue down floors, stained floors, epoxy floors, refinished floors, vinyl composition tile, and most other floor types.
2. Basis of Design Product: Model #RB VCT 3-108, as manufactured by Ram Board.

C. Edge Tape: Used to secure Temporary Floor Protection edges to flooring or wall surfaces.
1. Performance: Easy Release, low tack tape for up to 14 days. Grips tightly to Ram Board while easy release on flooring surfaces up to 14 days.
2. Basis of Design Product: Model #RB ET 2.5-180, as manufactured by Ram Board.

## 2.5 PORTABLE JOBSITE TRASH CONTAINERS

A. Portable Jobsite Trash Containers: Portable, reusable jobsite trash container.
1. Fits Trash Bags: 42 gal – 50 gal (159 to 189 L).
2. Quick self-locking assembly, no tape required.
3. Basis of Design Product: Trash Box Model # RBTB 16-36, as manufactured by Ram Board.

# PART 3 EXECUTION

## 3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation. Proceed with installation or protection products only after unsatisfactory conditions have been corrected.

B. Do not begin protection installation until substrates have been properly prepared.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

## 3.2 INSTALLATION

A. Install protection products in accordance with manufacture's written instructions and approved submittals.

## 3.3 PROTECTION

A. Protection installed products may be left in place until completion of project or adjacent work.

**END OF SECTION**

# SECTION 01 60 00.0 - PRODUCT REQUIREMENTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; comparable products and substitutiions.

### 1.3 DEFINITIONS

A. Refer to Section 01 42 16 - Definitions for the following terms:
   1. Product.
      a. Comparable Product.
      b. Named Products.
      c. New Products.
   2. Basis-of-Design Product Specification.
   3. Substitutions.
      a. Substitutions for Cause.
      b. Substitutions for Convenience.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 - Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. 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:
      a. Use facsimile of form provided in Project Manual.
      b. Use CSI form 13.1 A
   2. Include complete information as required in the Substitution Form. Incomplete information will result in automatic rejection of the substitution request.
   3. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and Contractor, that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
i. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
j. 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.
k. Cost information, including a proposal of change for a credit to the owner, if any, in the Contract Sum.
l. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
m. Submittals not requested will not be recognized or processed.

4. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
   a. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.6 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. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
   2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

B. 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.

## 1.7 PROCEDURES

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

## 1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

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

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

## 1.9 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. See other Sections for specific content requirements and particular requirements for submitting special warranties.

# PART 2 PRODUCTS

## 2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "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. Products:
   a. Non-restricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
2. Manufacturers:
   a. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
3. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
   1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Specification Section "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 SUBSTITUTIONS

A. 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:
   1. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   2. Substitution request is fully documented and properly submitted.
      a. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
         1) Statement indicating why specified product or fabrication or installation cannot beprovided, if applicable.
         2) Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and Contractors, that will be necessary to accommodate proposed substitution.
         3) Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
         4) Product Data, including drawings and descriptions of products and fabrication and installation procedures.
         5) Samples, where applicable or requested.
         6) Certificates and qualification data, where applicable or requested.

7) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
8) Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
9) 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.
10) 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.
11) Cost information, including a proposal of change for a credit to the owner, if any, in the Contract Sum.
12) Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
13) Submittals not requested will not be recognized or processed.

3. Requested substitution will not adversely affect Contractor's construction schedule.
4. Requested substitution has received necessary approvals of authorities having jurisdiction.
5. Requested substitution is compatible with other portions of the Work.
6. Requested substitution has been coordinated with other portions of the Work.
7. Requested substitution provides specified warranty.
8. 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 Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (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.

C. Substitutions for Convenience: Architect will consider requests for substitution if received ten (10) days prior to Bid and within thirty (30) days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
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 offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.
j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
k. Additional requirements as indicated on the Substitution Request Form.

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 60 00.1 - REQUEST FOR SUBSTITUTION FORM**

**PROJECT INFORMATION**

**PROJECT NAME AND NUMBER: _____**

**CONTRACT AWARD DATE:**

**_____**

**TO: _____**

**SUBSTITUTION REQUESTED BY: _____**

**REQUEST MADE DURING:**

_____ Bidding

_____ Construction Period

**CAUSE FOR REQUEST: _____**

**SUBSTITUTION INFORMATION**

**SUBMIT IN ACCORDANCE WITH SECTION 01 30 00.0 - ADMINISTRATIVE REQUIREMENTS.**

1. Technical data, cost, and time information relating to changes to Construction Documents required by proposed substitution.

2. Detailed comparison of proposed substitution and specified product including but not limited to warranty, significant variations, qualifications of manufacturers, and maintenance.

3. Complete technical data, detailed shop drawings, samples, installation procedures, warranty, and substantiating data marked to indicate equivalent quality and performance to that specified. Manufacturer sell sheets are not acceptable submittals.

**BASIS OF DESIGN**

Specified Manufacturer: _____

Specified Product: _____

Where Specified:

Drawing (Sheet Number and Detail/Schedule): _____

Specification: (Section Number and Paragraph): _____

**PROPOSED SUBSTITUTION**

We submit for consideration the following manufacturer / product in lieu of the specified item for the above referenced project:

Proposed Manufacturer: _____

Proposed Product: _____

**COST AND TIME**

Does proposed substitution affect adjacent work, Construction Documents, Cost, Schedule, Quality, or related submittals?

_____ No

_____ Yes

Contractor is responsible for costs and additional time associated with proposed substitution including costs incurred by Architect for evaluation of substitution and changes to the documents. Describe costs for changes to design, including engineering and detailing costs caused by requested substitution.

_____

_____

Cost Savings Realized by Owner ($ US): _____

**WARRANTY**

Is warranty for proposed substitution the same as for specified product?

_____ Yes
_____ No
If No, Explain Differences: _____
_____

**CONTRACTOR CERTIFICATION:**

In making this request for substitution, Contractor certifies that:

1. Proposed substitution has been thoroughly researched and evaluated and determined as equivalent or superior to specified product or material, will fit into space provided, and is compatible with adjacent materials.
2. Proposed substitution will provide the same or better warranty at no additional cost to the Owner.
3. Cost data is complete and includes related costs under the Contract. Claims for additional costs related to the proposed substitution that may subsequently become apparent are waived.
4. Contractor will assume responsibility for delays and costs caused by acceptance proposed substitution, if approved, are accepted by the Contractor unless delays and costs are specifically mentioned and approved in writing by Owner and Architect.
5. Contractor will assume liability for performance of the substitution.
6. Installation of the proposed substitution is coordinated with the Work and with changes required to the Work.
7. Contractor will reimburse Owner and Architect for evaluation and redesign services associated with the substitution request and, when required, for approval by authorities having jurisdiction.

**PREVIOUS USE**

Has the proposed substitute manufacturer / product been installed on previous PBK Architects, Inc. projects within the past two years?

_____ No
_____ Yes
If Yes, list project(s):
Project: _____
Owner:_____
Contact: _____
Project: _____
Owner: _____
Contact: _____

**SUBMITTED BY:**

Contractor's Signature: _____
Signature shall be by the individual authorized to legally bind the Contractor to the above terms. Failure to provide legally binding signature will result in retraction of acceptance.

Firm: _____

Telephone: _____ Date: _____

**SUBSTITUTION EVALUATION**

**FOR USE BY ARCHITECT:**

___ Accepted ___ Accepted as Noted ___ Not Accepted ___ Received too Late

By: _____ Date: _____

Remarks: _____

**FOR USE BY OWNER:**

____ Accepted _____ Not Accepted

By: _____ Date: _____

Remarks: _____

_____

**END OF SECTION**

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# SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition.

C. Pre-installation meetings.

D. Cutting and patching.

E. Surveying for laying out the work.

F. Cleaning and protection.

G. Starting of systems and equipment.

H. Demonstration and instruction of Owner personnel.

I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

### 1.3 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.4 SUBMITTALS

A. Refer to Section 01 30 00.0 - Administrative Requirements, for submittal procedures.

B. Demolition Plan: Submit demolition plan
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.
   6. Include in request:
      a. Identification of Project.
      b. Location and description of affected work.
      c. Necessity for cutting or alteration.
      d. Description of proposed work and products to be used.
      e. Alternatives to cutting and patching.
      f. Effect on work of Owner or separate Contractor.
      g. Written permission of affected separate Contractor.
      h. Date and time work will be executed.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

### 1.5 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
   2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.
   2. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
   3. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.

E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
   1. Pest Control Service: Weekly treatments.

F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

### 1.6 COORDINATION

A. See Section 01 10 00 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

## PART 2 PRODUCTS

### 2.1 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Substitutions: See Section 016000 - Product Requirements for substitution procedures.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### 3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### 3.3 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### 3.4 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

F. Make neat transitions between different surfaces, maintaining texture and appearance.

## 3.5 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
   2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.
   5. Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
3. Where a change of plane of 1/4 inch (6 mm) or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

**3.6 CUTTING AND PATCHING**

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

J. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

## 3.7 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

## 3.8 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.

G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

## 3.9 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect and Owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

## 3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

## 3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See Division 23 for testing, adjusting, and balancing for HVAC information.

## 3.12 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.
   1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

## 3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Owner will occupy all of the building as specified in Section 01 10 00.

F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

H. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

I. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

**END OF SECTION**

# SECTION 01 73 20 - INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. General requirements and procedures for achieving acceptable indoor air quality for the interior areas of this Project during construction, and preventing contamination of ductwork, HVAC equipment, and other building materials to avoid IAQ problems for workers and for occupants in the future after occupancy. Work includes requirements on the use of permanent building mechanical systems prior to Owner's acceptance.

B. Contractor shall prepare and submit an Indoor Air Quality (IAQ) Management Plan.

### 1.3 REFERENCE STANDARDS

A. ANSI/SMACNA 008 - IAQ Guidelines for Occupied Buildings Under Construction; Current Edition.

B. SMACNA (IAQ) - IAQ Guidelines for Occupied Buildings Under Construction; Current Edition.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 ACTION SUBMITTALS

A. See Section 01 30 00.0 - Administrative Requirements and 01 60 00 - Product Requirements for submittal procedures.

B. IAQ Construction Management Plan: Submit 3 Copies of the plan within 30 days of the date established for commencement of the Work. Update and resubmit plan as required during construction process to reflect Project conditions.

C. Meeting Minutes: Submit minutes from the Contractor meetings related to the execution and verification of the IAQ Construction Management Plan.

D. Product Data: Submit cut sheets of filtration media proposed for use.

### 1.6 QUALITY ASSURANCE

A. Contractor's Construction IAQ Management Plan shall meet or exceed the 5 recommended design approaches of SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008, (Chapter 3), and shall embody the principals and practices set forth in this Section.

B. IAQ Management Conference: Conduct conference at Project site to comply with the requirements in Division 1 Section "Project Management and Coordination."
   1. Review methods and procedures related to IAQ management during construction.
   2. Review IAQ management requirements with each trade.

C. Comply with the requirements of LEED IEQC 3.1 Construction Indoor Air Quality Management, During Construction and Contractor's Construction IAQ Management Plan during construction.

### 1.7 IAQ CONSTRUCTION MANAGEMENT PLAN

A. Contractor IAQ Construction Management Plan shall include procedures to prevent indoor air quality problems resulting from the construction process in order to help sustain the comfort and well-being of construction workers and future building occupants.

B. Contractor's detailed plan shall be based on the particular characteristics of the Project.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION**

**3.1 HVAC PROTECTION (SMACNA APPROACH NUMBER 1)**

A. Store HVAC equipment including but not limited to items such as ducting, registers, air handler components, fans, and motors in a clean, dry location, protected from dust and other contaminants, and covered with plastic until installed.

B. Seal all HVAC inlets and outlets.

C. Use of the HVAC system shall be avoided during construction, until drywall construction and activities that produce dust or particulate pollution have been completed. Temporary ventilation may be installed to remove contaminants. All HVAC components including but is not limited to outside air inlets, grills, diffusers, supply ducts, return ducts, ceiling plenums, VAV (variable air volume) plenum intakes, and window ventilator or air conditioning units shall be sealed during construction.

D. Seal HVAC components during installation. Duct runs that require several days to install; sections shall be sealed off as they are completed. Seals shall be removed prior to continuing the duct run. Other components of the HVAC system shall be subject to the same requirements to protect them from contamination.

E. Provide frequent inspection and maintenance of HVAC component protection. Replace as necessary. If inspections by the Architect, Engineer, Owner, or Commissioning Agent reveal that the ductwork has been contaminated due to inadequate protection, the ductwork shall be cleaned professionally prior to activation of the HVAC system or occupancy, using procedures established in ACR 2005 published by the National Air Duct Cleaners Association. HVAC components that have been damaged or contaminated shall be cleaned or replaced as necessary.

F. Use temporary filtration media. If HVAC system is to be used while construction work is being done, temporary media filtration media shall be installed on all air intakes. Such filtration shall have a minimum filtration efficiency (Minimum Efficiency Reporting Value-MERV per ASHRAE 52.2) of 8. For air intakes into other parts of the building that are very sensitive, such as computer rooms, filtration media with a MERV rating of 13 or higher is required.

G. Inspect filters weekly replace as needed for proper filtration and air flow.

H. Avoid contamination of air entry into enclosed parts of the building. When outdoor construction activities generate dust, combustion emissions, or other contaminants, operable windows and outside air supplies to enclosed portions of the building will be closed or sealed.

I. Do not use fan, mechanical, or electrical rooms to store construction or waste materials. Keep these rooms clean and neat.

J. Ceiling tiles shall not be installed until after drywall and painting is complete to avoid contamination of ceiling tiles that will form the return air plenum.

**3.2 SOURCE CONTROL (SMACNA APPROACH NUMBER 2)**

A. The use of moisture-damaged materials shall not be allowed. Any porous materials that have become wet shall be dried thoroughly within 48 hours and before installation. Any materials damaged, showing visible mold, or that are wet for over 48 hours shall be removed from the site appropriately.

B. Contractor to ensure that the construction process will not result in moisture intrusion. In the event of rain or groundwater intrusions notify the Owner’s representative.

C. Avoid tracking pollutants into the work areas.
   1. At the start of framing and mechanical system installation, access to the building shall be controlled to minimize the tracking of contaminants.
   2. Material deliveries and construction waste removal shall be routed by the most direct route to and from the building exterior.

3. Provide rough track off grates or matting at the entryway to remove moisture and contaminants from pedestrian traffic.
4. Prevent the ingress of rodents and pests.
5. Food and drinks other than water shall not be allowed in the building.
6. Trash containers will be primarily located outside of the building. Any interior trash containers will be emptied twice a week at a minimum.
7. Use procedures to ensure that there is no smoking in the building, storage areas of absorptive materials, or within 25 ft of air intakes or building openings.

D. Limit construction traffic and monitor idling vehicles and equipment in the vicinity of air intakes when the HVAC systems are activated. Restrict vehicles to a loading area, well removed from air intakes. Prevent emissions from being drawn into the building.

E. Use electric or natural gas alternatives to gasoline and diesel equipment when possible.

F. All personnel lifts used inside the building will be electrically operated to prevent emissions inside the building.

G. Cycle vehicles and equipment off when not being used.

H. Avoid the use of materials and products with high VOC and particulate levels. Inside the building use products and installation methods with low VOCs such as paints and coatings, adhesives and sealants, and cleaners.

I. The project's specifications/LEED guidelines call for the use of low-VOC materials. Daily inspections will be made by the Contractor's project manager and/or superintendent to ensure the products being used in the field are the specified and approved products.

J. Keep containers of wet products closed when not in use. Cover and seal materials which can release odor or dust.

K. Containers of fuel, volatile liquids, and materials with high VOC content shall be tightly sealed and stored outside of the building.

L. Protect absorbent materials from moisture during delivery to and storage at the job site. Store materials in a dry and clean environment.

### 3.3 PATHWAY INTERUPTION (SMACNA APPROACH NUMBER 3)

A. Use dust curtains or temporary enclosures to prevent dust from migrating to other areas when applicable. During construction, isolate areas of work to prevent contamination of clean or occupied areas.

B. Keep pollutant sources as far away as possible from absorptive materials, ductwork, and areas occupied by workers.

C. Isolate work areas and or create pressure differentials to prevent the migration of contaminants.

D. Use portable fan systems to exhaust contaminated air directly to the outside of the building and discharge the air to prevent recirculation.

### 3.4 HOUSE KEEPING (SMACNA APPROACH NUMBER 4)

A. Keep HVAV components, not limited to coils, air filters, dampers, fans, and ductwork, clean during installation, and clean them as required prior to performing the testing, adjusting, and balancing of the systems.

B. Construction shall minimize the production and accumulation of dust and other contaminants. Use integral dust collection systems on drywall sanders, cut saws, and routers. Confine dust-generation activities to areas where cleaning can be carried out easily and where contaminants will not be tracked or contaminate other areas.

C. Wetting agents or sweeping compounds shall be used to keep dust from becoming airborne.

D. Wet cloths, damp mops, and vacuum cleaners with high efficiency particulate (HEPA) filters shall be used to clean. Cleaning frequency shall be increased when dust accumulation is noted.

E. All spills and excess applications of solvent-containing products shall be cleaned using approved methods immediately. Water spills shall be cleaned up promptly.

F. Avoid accumulation of water inside the building and promptly remove any water that may occur. Protect porous materials such as insulation, ceiling tiles and drywall from water or moisture.

G. Construction areas shall be kept dry. Promptly repair any leaks or penetrations that allow water to enter the building. Use dehumidification as necessary for prompt drying of wet surfaces and materials.

H. Clean rough track off grates or matting at the entryway as necessary, at a minimum weekly to reduce dirt and particulates from entering the building, when building is enclosed.

I. 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. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable use products that comply with the California Code of Regulations maximum allowable VOC levels.

## 3.5 SEQUENCING AND SCHEDULING (SMACNA APPROACH NUMBER 5)

A. Schedule the installation of porous materials after enclosure of the building. Porous materials shall not be installed until the building envelope is fully weather tight.

B. Install porous or absorbent materials such as ceiling tiles, after odorous activities including drywall installation, painting, and floor finishing is completed.

C. Do not allow contaminants from an area under construction to enter the HVAC systems or to migrate to completed areas of construction.

D. Install new MERV 8 filters prior to the FF&E move-in and occupancy.

E. Install furnishing after interior finishes have applied and fully cured.

F. Provide adequate ventilation during curing period. To aid in curing of interior finishes and other products used during construction and to remove pollutants after drywall installation is complete provide adequate ventilation with 100% outside air, and proper filtration for any HVAC components activated. During humid periods or when high moisture materials are present, supplementary dehumidification may be required.

G. All sanding of the concrete floors, floor preparation, and the poured-in-place terrazzo will be scheduled before the HVAC system startup.

H. All drywall sanding and painting will be scheduled before the HVAC system startup.

I. Move-in of all FF&E will occur after all construction activities have been substantially completed and the HVAC has been tested and balanced.

## 3.6 MONITORING AND IMPLEMENTATION OF IAQ PLAN

A. Contractor to designate an on-site responsible staff member for instructing personnel and overseeing the Construction IAQ Management Plan.

B. Provide weekly Contractor site co-ordination meetings with subcontractors. Review appropriate components of the IAQ Construction Management Plan as a regular action item. Document the implementation of the Plan in the meeting minutes and update the IAQ Construction Management Plan as required.

C. Subcontractors and their employees shall be provided instruction and Training in the Indoor Air Quality (IAQ) Management Plan.

D. Recording format: Use SMACNA (IAQ) Guidelines Appendix C (Planning Checklist) and Appendix D (Inspection Checklist) as a guide.

**END OF SECTION**

# SECTION 01 73 29 - CUTTING AND PATCHING

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Procedural requirements for cutting and patching.

### 1.3 DEFINITIONS

A. Refer to Section 01 42 16 - Definitions for the following terms:
   1. Cutting.
   2. Patching.

### 1.4 REFERENCES

A. Refer to specification Section 014100 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements and Section 01 60 00 – Product Requirements for submittal procedures.

B. 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 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.

### 1.6 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

B. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

C. Operational Elements: Do not cut and patch operating elements and related components that results in reducing the capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
   1. Primary operational systems and equipment.
   2. Fire separation assemblies.
   3. Air or smoke barriers.
   4. Fire suppression systems.

5. Mechanical systems piping and ducts.
6. Control systems.
7. Communication systems.
8. Fire detection and alarm systems.
9. Conveying systems.
10. Electrical wiring systems.
11. Operating systems of special construction.

D. Miscellaneous Elements: Do not cut and patch the following elements or related components that change the load bearing capacity, resulting in a reduction of capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior curtain wall construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise and vibration control elements and systems.
7. Sprayed fire resistive material.

E. Visual Requirements: Do not cut and patch construction resulting in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
1. If possible, retain original Installer or fabricator to cut and patch exposed Work. If possible, engage original Installer or fabricator. If original installer is not available, engage recognized, experienced, and specialized firm for the Work.
a. Firestopping.
b. HVAC enclosures, cabinets, or covers.

F. Cutting and Patching Conference: Before proceeding, meet at site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

G. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

### 1.7 WARRANTY

A. 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.

B. Extend a one-year labor and materials warranty against defects in failure of patch work due to material defects or workmanship.

## PART 2 PRODUCTS

### 2.1 MATERIALS

A. Comply with specified requirements.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where removal, relocation, or abandonment is necessary, bypass existing services before cutting to avoid interruption of services to occupied areas.

## 3.3 CUTTING AND PATCHING

A. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at earliest feasible time, and complete without delay.
1. Cut existing construction to provide for installation of components or performance of construction, and subsequently patch as necessary to restore surfaces to an original condition.
2. 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 Utility Information: Furnish information to local utility 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.

C. 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.

D. 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.

E. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

F. Temporary Support: Provide temporary support of Work to be cut.

G. 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.

H. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 - Summary.

I. Cutting: Cut existing 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. Use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from 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 earthwork specifications 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.

J. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction to 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 are removed, extend one finished area into another, patch and repair surfaces in new space. Provide even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
   4. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   5. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
   6. Exterior Building Enclosure: Patch components and restore enclosure to a weathertight condition.

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

1. 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.

**END OF SECTION**

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# SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Administrative and procedural requirements for the following:
   1. Disposing of non-hazardous waste.

### 1.3 DEFINITIONS

A. Refer to Section 01 42 16 - Definitions for the following terms:
   1. Construction Waste.
   2. Demolition Waste.
   3. Disposal.
   4. Recycle.
   5. Salvage.
   6. Salvage and Reuse.

### 1.4 REFERENCES

A. Refer to specification Section 014100 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Firm having minimum 10 years documented experience in specializing in waste management coordination.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

### 1.6 PERFORMANCE REQUIREMENTS

A. Conform to applicable regulations regarding Solid Waste Control.

B. Practice efficient waste management in the use of materials in the course of the Work.

### 1.7 WASTE MANAGEMENT PLAN

A. Develop a waste management plan and requirements.
   1. Submit plan within 20 days of date established for Notice to Proceed.

## PART 2 PRODUCTS (NOT APPLICABLE)

## PART 3 EXECUTION

### 3.1 PLAN IMPLEMENTATION

A. 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 01 50 00 - 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. Site Access and Temporary Controls:
   1. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities:

a. Comply with Section 01 50 00 - Temporary Facilities and Controls for the control of dust and dirt, environmental protection, and noise control.

### 3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the work:
   1. Salvage items for reuse and handle:
      a. Clean salvaged items.
      b. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
      c. Store items in a secure area until installation.
      d. Protect items from damage during transport and storage.
      e. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Plumbing Fixtures: Separate by type and size.

C. Lighting Fixtures: Separate lamps by type and protect from breakage.

D. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

### 3.3 RECYCLING WASTE

A. 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:
   1. 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:
      a. 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:
      b. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
      c. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
      d. Store components off the ground and protect from the weather.
      e. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

### 3.4 DISPOSAL OF WASTE

A. Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction:
   1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.

**END OF SECTION**

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# SECTION 01 78 00 - CLOSEOUT SUBMITTALS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Project record documents.

B. Operation and maintenance documentation directory manuals.

C. Emergency manuals.

D. Operation and maintenance data.

E. Warranties and bonds.

### 1.3 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

## PART 2 PRODUCTS (NOT APPLICABLE)

## PART 3 EXECUTION

### 3.1 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

## 3.2 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

A. Operation and Maintenance Documentation Directory:
   1. Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
      a. List of systems and subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
      b. 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.
      c. Tables of contents: Include a table of contents for each emergency, operation, and maintenance manual.

## 3.3 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:
   1. Organize manual into a separate section for each of the following:
      a. Type of emergency.
      b. Emergency instructions.
      c. Emergency procedures.

C. Type of Emergency:
   1. Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
      a. Flood.
      b. Gas leak.
      c. Water leak.
      d. Power failure.
      e. Water outage.
      f. System, subsystem, or equipment failure.
      g. 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:
   1. Include the following, as applicable:
      a. Instructions on stopping.
      b. Shutdown instructions for each type of emergency.
      c. Operating instructions for conditions outside normal operating limits.
      d. Required sequences for electric or electronic systems.
      e. Special operating instructions and procedures.

### 3.4 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

### 3.5 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

### 3.6 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
   1. Include HVAC outdoor and exhaust air damper calibration strategy.
      a. Include provisions which ensure that full closure of dampers can be achieved.
   2. Include Carbon Dioxide Monitoring Protocol.
   3. Include Carbon Monoxide Monitoring Protocol.
   4. Include Frost Mitigation Strategy for ventilation heat-recovery system.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

O. Include test and balancing reports.

P. Additional Requirements: As specified in individual product specification sections.

## 3.7 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Operation and maintenance data.
      c. Field quality control data.
      d. Photocopies of warranties and bonds.
   4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

## 3.8 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Form of Submittals
   1. Prepare in duplicate packets.
   2. Format:
      a. Size: 8-1/2" x 11" punch sheets for standard 3-ring binder:
         1) Fold larger sheets to fit into binders.
      b. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
         1) Title of Project.
         2) Location of Project.
         3) Name of general contractor.
   3. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers, all of same color.

C. Verify that documents are in proper form, contain full information, and are notarized.

D. Time of Submittals
   1. For equipment or component parts of equipment put into service during progress of construction:
      a. Warranties shall start at the Date of Substantial Completion for each phase of work complete for the items related to that particular phase. The final warranties for the project will list the individual dates for the start date of each warranty per phase.
         1) Submit documents as indicated with Closeout Documents.
   2. For items of work where acceptance is delayed materially beyond Date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

E. Retain warranties and bonds until time specified for submittal.

**END OF SECTION**

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# SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Administrative and procedural requirements for project record documents, including but not limited to:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.
   4. Miscellaneous record submittals.

### 1.3 SUBMITTALS

A. At Substantial Completion, deliver Record Documents to Architect for review prior to sending to the Owner.

B. Accompany submittal with transmittal letter in duplicate, containing:
   1. Date.
   2. Project title and number.
   3. Contractor's name and address.
   4. Title and number of each Record Document.
   5. Signature of general contractor or his authorized representative.

### 1.4 CLOSEOUT SUBMITTALS

A. Record Drawings:
   1. Number of Copies: Submit one set of marked up record prints.

B. Record Specifications: Submit one paper copy and one annotated PDF electronic file of the Project Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one paper copy and one annotated PDF electronic file and directory of each submittal.

D. Miscellaneous Record Submittals: Refer to the individual Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Submit one paper copy and annotated PDF electronic files and directories of each submittal.

### 1.5 PROJECT RECORD DOCUMENT PROCEDURES

A. Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect’s reference.
   1. Do not use As-Built Drawings and Specifications for Record Drawings and Specifications.

B. Recording Procedures: Update drawings and specifications on daily bases to record actual conditions. Record information concurrently with construction progress. Do not conceal Work until required information is accurately recorded.

C. Store Record Documents and samples apart from as built documents used for construction.
   1. Label and file Record Documents and samples in accordance with section number listings in Table of Contents. Label each document PROJECT RECORD in neat, large, printed letters.
   2. Maintain Record Documents in clean, dry and legible condition.
   3. Make Record Documents and samples available for inspection upon request of Architect.

## PART 2 PRODUCTS

### 2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked up paper copies of the Contract Drawings and Shop Drawings.
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked up record prints. Show actual installation conditions where installation varies from that shown originally.
      a. Give attention to information on concealed elements difficult to identify or measure and record later.
      b. Accurately record information in an acceptable drawing technique.
      c. Record data as soon as possible after obtaining it.
      d. Record and check the markup before enclosing concealed installations.
      e. Cross reference record prints to corresponding shop drawings or archive photographic documentation.
   2. Content: Types of items requiring marking include, but are not limited to, the following:
      a. Dimensional changes to Drawings.
      b. Revisions to details shown on Drawings.
      c. Depths of foundations below first floor.
      d. Locations and depths of underground utilities.
      e. Revisions to routing of piping and conduits.
      f. Revisions to electrical circuitry.
      g. Actual equipment locations.
      h. Duct size and routing.
      i. Locations of concealed internal utilities.
      j. Changes made by Change Order or Construction Change Directive.
      k. Changes made following Architect's written orders.
      l. Details not on the original Contract Drawings.
      m. Field records for variable and concealed conditions.
   3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked up record prints.
   4. Mark record sets with erasable, red colored pencil. Use colors to distinguish between changes for different categories of the Work at same location.
   5. Mark important additional information that was either shown schematically or omitted from original Drawings.
   6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked up record prints with Architect. When authorized, prepare full set of corrected digital data files of the Contract Drawings:
   1. Format: Same digital data software program, version, and operating system as the original Contract Drawings and annotated PDF electronic file with comment function enabled.
   2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
   3. Refer instances of uncertainty to Architect for resolution.
   4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
      a. Refer to Section 01 33 00 - Submittal Procedures for requirements related to use of Architect's digital data files.

C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
   1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or modification.
   2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

D. Format: Identify and date each record Drawing; include the designation PROJECT RECORD DRAWING in a prominent location.
   1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
   2. Format: Annotated PDF electronic file with comment function enabled.
   3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
   4. Identification: As follows:
      a. Project name.
      b. Designation PROJECT RECORD DRAWINGS.
      c. Name of Architect.
      d. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications. Indicate actual product installation where installation varies from that indicated in Specifications.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
   3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
   4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
   5. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

## 2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

## 2.4 RECORD SAMPLES

A. Record Samples: Determine with Architect and Owner which submitted Samples are to be maintained as Record Samples. Maintain and mark one set to indicate date of review and

approval by Architect; note any deviations or variations between reviewed sample and installed product or material.

**PART 3 EXECUTION**

**3.1 RECORDING AND MAINTENANCE**

A. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

**END OF SECTION**

# SECTION 02 41 19 - SELECTIVE DEMOLITION

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INLCUDES

A. Provide labor, material, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
   1. Demolition and removal of selected portions of building or structure.
   2. Salvage of existing items to be reused or recycled.

### 1.3 REFERENCE STANDARDS

A. Comply with NFPA 1 – Chapter 16 and NFPA 241 Standard for Safeguarding Construction Alteration and Demolition Operation Latest Adopted Edition.

### 1.4 REFERENCES:

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 DEFINITIONS

A. Refer to Section 01 42 16 – Definitions, for the following terms:
   1. Remove.
   2. Remove and Salvage.
   3. Remove and Reinstall.
   4. Existing to Remain.
   5. Dismantle.

### 1.6 MATERIALS OWNERSHIP

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

B. Carefully salvage indicated items in a manner to prevent damage and promptly return to Owner where indicated.

### 1.7 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Qualification Data: For refrigerant recovery technician.

D. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

### 1.8 PRE-DEMOLITION MEETING

A. The Contractor shall conduct a pre-demolition meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
   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.

6. Review and finalize protection requirements.
7. Review procedures for noise control and dust control.
8. Review procedures for protection of adjacent buildings.
9. Review items to be salvaged and returned to Owner.

### 1.9 QUALITY ASSURANCE

A. Demolition Firm: Company specializing in performing the Work of this Section with minimum five years documented experience.

B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

### 1.10 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and drawings before proceeding with selective demolition.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

F. Maintain fire-protection facilities in service during selective demolition operations.

G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

### 1.11 HAZARDOUS MATERIALS

A. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is included in this Project Manual. Refer to Section 00 31 26.0 - Existing Hazardous Material Information. Examine report to become aware of locations where hazardous materials are present.

### 1.12 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of capped utilities, subsurface obstructions, and structures.

### 1.13 SALVAGE

A. The Owner has the first right to salvage reusable equipment.

B. The Contractor shall salvage indicating items for reuse in the project.

C. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Comply with specification section "Photographic Documentation."

D. Salvage: Items indicated to be removed for salvaged:

E. Clean salvaged items of dirt and demolition debris.

F. Store items in a secure area until delivery to Owner.

G. Protect items from damage during transport and storage.

H. The following items are to be salvage for reuse in the project:
   1. Bathroom sinks.
   2. The following toilet room accessories:
      a. Paper towel dispensers.
      b. Mirrors.

### 1.14 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

C. Conform to applicable codes for demolition of structures, safety of adjacent structures, dust control, runoff, and erosion control, and disposal of demolished materials.

D. Obtain required permits from authorities having jurisdiction.

E. Notify affected utility companies before starting work and comply with their requirements.

F. Do not close or obstruct roadways, sidewalks, and hydrants, without permits.

G. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials and contact the Architect and Owner immediately if discovered.

H. Test soils around buried tanks for contamination.

I. No demolition will occur during occupied hours without the permission of the Owner.

### 1.15 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. 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 (NOT APPLICABLE)

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

E. Salvaged Items: Provide photographs or video of equipment to be salvaged prior to commencing work and conditions that might be misconstrued as damage caused by salvage operations.

### 3.2 CLARIFICATION

A. The drawings do not purport to show all objects existing on the site.

B. Before commencing the work of this section, verify with the architect all objects to be removed and all objects to be preserved.

### 3.3 SCHEDULING

A. Schedule all work in a careful manner with all necessary consideration for the public and the Owner.

B. Avoid interference with the use of, and passage to and from, adjacent facilities.

### 3.4 GENERAL

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 existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. For Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
   5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other sections of these specifications.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
   3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
   5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

### 3.5 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

### 3.6 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished. Refer to engineering drawings for further information.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Contractor to arrange to shut off utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on drawings to be removed.
    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
    f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

## 3.7 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
    1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
    2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
    3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
    1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

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

## 3.8 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
    1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
    2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 24 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

## 3.9 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

E. 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.

F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
1. Remove existing roof membrane, flashings, copings, and roof accessories.
2. Remove existing roofing system down to substrate.

## 3.10 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in specification section “Construction Waste Management and Disposal.”

B. Burning: Do not burn demolished materials.

### 3.11 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**

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# SECTION 03 10 00 - CONCRETE FLOOR REMOVAL AND REPLACEMENT

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Provide labor, material, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
   1. Concrete removal and replacement.
   2. Reinforcement.
   3. Accessories.

### 1.3 REFERENCE STANDARDS

A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

C. ASTM F1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor; 2025.

D. ACI 117 – Standard Tolerances for Concrete Construction and Materials.

E. ACI 301 – Specifications for Structural Concrete for Buildings.

F. ACI 302.1R – Guide for Concrete Floor and Slab Construction.

G. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

H. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

I. ASTM C33 – Standard Specification for Concrete Aggregates.

J. ASTM C150 – Standard Specification for Portland Cement.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.

D. Qualification Data: For concrete specialist.

E. Material Certificates: For each type of portland cement and aggregate supplied for mixing or adding to products at Project site.

### 1.6 QUALITY ASSURANCE

A. Concrete-Maintenance Specialist Qualifications: Engage an experienced concrete firm that employs installers and supervisors who are trained to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing or patching new concrete is insufficient experience for concrete-maintenance work.

### 1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.

B. Store cementitious materials off the ground, under cover, and in a dry location.

C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.

### 1.8 FIELD CONDITIONS

A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.

B. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F (32 deg C) and above.

## PART 2 PRODUCTS

### 2.1 CONCRETE, GENERAL

A. Comply with ACI 301, ACI 302, and ACI 117 (ACI 117M).

### 2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615, Grade 60.

B. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

### 2.3 CONCRETE MATERIALS

A. Cementitious Materials:
   1. Portland Cement: ASTM C 150/C 150M, or Type III.

B. Normal-Weight Aggregate: ASTM C 33/C 33M, 1/2-inch nominal maximum aggregate size.

C. Air-Entraining Admixture: ASTM C 260/C 260M.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

E. Water: ASTM C 94/C 94M.

### 2.4 FIBER REINFORCEMENT

A. Synthetic Micro-Fiber: Monofilament or fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches (38 mm) long.

### 2.5 CURING MATERIALS

A. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

### 2.6 BONDING AGENTS

A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Manufactured product that consists of water-insensitive epoxy adhesive, portland cement, and water-based solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.

### 2.7 SHEET MATERIALS

A. Below Grade Sheet Retarder shall have the following properties:
   1. Basis of Design: “Stego Vapor Barrier” as manufactured by Stego Co.
   2. Permeance Rating: Per ASTM E96 or ASTM F1249. Material shall meet permeance requirement for both new material and after ASTM E1745 mandatory condition test sections 8, 11, 12, and 13.
   3. Water Vapor Retarder: Meet or exceed Class A per ASTM E1795
   4. Polyethylene film, 15-mil thick, and perm rating of .01 perms (gr/ft2/hr/in-HG)

B. Polyurethane Sealant: ASTM C920, single component, chemical curing, non-sagging, and black color
   1. Elongation Capability: 25%
   2. Shore A Hardness Range: 20 to 35

C. Tape shall be as required by the manufacturer of the vapor retarder with a maximum water vapor transmission rate of .03 perms (ASTM E 96).

### 2.8 CONCRETE MIXTURES

A. Comply with ACI 301 (ACI 301M).

B. Normal-Weight Concrete:
   1. Minimum Compressive Strength: 4000 psi (27579.04 kPa) at 28 days.
   2. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
   3. Slump: 4 inches (101.6 mm) to 5 inches (127 mm) with verified slump of 2 to 4 inches before adding high.
   4. Air Content: Maintain within range permitted by ACI 301 (ACI 301M). Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

### 2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116 and furnish batch ticket information.
   1. When air temperature is above 90 degrees Fahrenheit (32.22 degrees Celsius), reduce mixing and delivery time to 60 minutes.

## PART 3 EXECUTION

### 3.1 GENERAL

A. Have concrete-maintenance work performed only by qualified concrete-maintenance specialist.

B. Comply with manufacturers' written instructions for surface preparation and product application.

### 3.2 PREPARATION

A. Ensure that supervisory personnel are on-site and on duty when work begins and during its progress.

B. Protect surrounding surfaces of building from harm resulting from work.
   1. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
   2. Use only proven protection methods appropriate to each area and surface being protected.

3. Provide temporary barricades, barriers, and directional signage to exclude public from areas where concrete maintenance work is being performed.
4. Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.
5. Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
6. Dispose of debris and 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.

C. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.
1. Prevent solids such as aggregate or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from concrete maintenance work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

D. Preparation for Concrete Removal: Examine construction to be repaired to determine best methods to safely and effectively perform concrete maintenance work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.
1. Verify that affected utilities have been disconnected and capped.

## 3.3 CONCRETE REMOVAL

A. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch (12.7 mm). Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.

B. Thoroughly clean removal areas of loose concrete, dust, and debris.

## 3.4 BONDING AGENT APPLICATION

A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Apply to concrete by stiff brush or hopper spray according to manufacturer's written instructions. Apply to reinforcing bars in two coats, allowing first coat to dry two to three hours before applying second coat. Allow to dry before placing patching mortar or concrete.

## 3.5 SOIL TREATMENT

A. Soil Treatment: Treat soil per specification Section 31 31 16.

## 3.6 VAPOR BARRIER INSTALLATION

A. Install, protect, and repair vapor retarders according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.

B. Remove loose or foreign matter that might impair adhesion.

C. Clean and prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

D. Vapor barrier shall be installed in accordance with manufacturer's specifications, free of air pockets and wrinkles.

E. All laps shall be continuously sealed with adhesive according to manufacturer's recommendations.

F. Lap all joints a minimum of 6” and tape joints.

G. Seal all penetrations (including pipes) per manufacturer’s requirements with tape to restore barrier integrity.

H. Secure to existing vapor barrier at least 6” where possible. If not possible provide 2” tape lap under existing vapor barrier and tie in new vapor barrier and provide additional tape to provide a tight seal.

### 3.7 REINFORCEMENT INSTALLATION

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Install #5 rebar dowels 12" long at 24" o.c. around perimeter of opening. Drill 6” deep hole in existing concrete and secure with non-shrink grout.

C. Install welded wire fabric and lap adjoining pieces at least one full mesh and lace splices with 16-gauge wire.

### 3.8 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

C. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
   1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

### 3.9 CONCRETE PLACEMENT

A. Comply with ACI 301 for placing concrete.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

C. Do not add water to concrete during delivery, at Project site, or during placement.

D. Consolidate concrete with mechanical vibrating equipment according to ACI 301.

### 3.10 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
   1. Do not further disturb surfaces before starting finishing operations.

C. Finish: Match adjacent existing floor finishes unless otherwise indicated.

### 3.11 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 (ACI 301M) for hot-weather protection during curing.

B. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

C. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours

later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.12 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Tests: Perform according to ACI 301 (ACI 301M).
   1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
   2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

**END OF SECTION**

# SECTION 04 10 24 - MASONRY REPAIR

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INLCUDES

A. Provide labor, material, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
   1. Infilling openings in masonry (face brick) at mechanical equipment removal.
   2. Repair of existing interior concrete unit masonry units damaged during demolition process.

### 1.3 REFERENCE STANDARDS

A. ASTM C67 – Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.

B. ASTM C90 – Standard Specification for Loadbearing Concrete Masonry Units.

C. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.

D. ASTM C150 – Standard Specification for Portland Cement.

E. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.

F. ASTM C216 – Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)

G. ASTM C1392/C1392M – Standard Specification for Mortar Cement.

### 1.4 REFERENCES:

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: For each type of product.
   1. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.

### 1.6 QUALITY ASSURANCE

A. Mockups: Prepare mockups of masonry repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
   1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

### 1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

### 1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.

## PART 2 PRODUCTS

### 2.1 PRODUCTS:

A. Shapes: Provide shapes with exposed surfaces matching existing exposed faces of adjacent units.

B. Existing Face Brick: Match existing/adjoining face brick units in texure, color, coursing and bond. Refer to Section 04 26 13 - Masonry Veneer.

### 2.2 MORTAR MATERIALS

A. Mortar Cement: ASTM C 1329/C 1329M.

B. Mortar Sand: ASTM C 144.
   1. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

C. Water: Potable.

### 2.3 MORTAR MIXES

A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

B. Do not use admixtures in mortar unless otherwise indicated.

## PART 3 EXECUTION

### 3.1 MASONRY REPAIR, GENERAL

A. Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect.

### 3.2 MASONRY INSTALLATION REPLACEMENT

A. Install masonry into bonding and coursing pattern of existing masonry. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
   1. Maintain joint width for replacement units to match existing joints.
   2. Use setting buttons or shims to set units accurately spaced with uniform joints.

B. Lay replacement masonry with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into place. Wet both replacement and surrounding masonry.
   1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing masonry.

### 3.3 MASONRY UNIT PATCHING

A. Patch the following masonry units:
   1. Patch masonry units with voids and holes.
   2. Remove loose material from masonry surface. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least 1/4 inch thick, but not less than recommended by patching compound manufacturer.
   3. Rinse surface to be patched and leave damp, but without standing water.
   4. Brush-coat surfaces with slurry coat of mortar compound.
   5. Place mortar compound in layers, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
   6. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane of masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
   7. Keep each layer damp for 72 hours or until patching compound has set.

### 3.4 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.
   1. Do not use metal scrapers or brushes.
   2. Do not use acidic or alkaline cleaners.

B. Clean adjacent non-masonry surfaces. Use detergent and soft brushes or cloths.

C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Remove masking materials, leaving no residues that could trap dirt.

**END OF SECTION**

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# SECTION 04 26 13 - MASONRY VENEER

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specification and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Hollow brick.

B. Mortar and grout.

C. Reinforcement and anchorage.

D. Flashings.

E. Accessories.

### 1.3 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

### 1.4 PRICE AND PAYMENT PROCEDURES

A. The cost of the face brick, delivery and installation is to be included in the base bid.

### 1.5 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2026.

C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2026.

D. ASTM C91/C91M - Standard Specification for Masonry Cement; 2025.

E. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

F. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2024.

G. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2024.

H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025b.

I. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

### 1.6 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.7 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

### 1.8 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 6 0 00 - Product Requirements for substitution requirements.

C. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.

D. Samples: Submit four samples of facing brick units to illustrate color, texture, and extremes of color range.

E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

### 1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

### 1.10 MOCK-UP

A. Construct a masonry wall as a mock-up panel at one of the openings required to be infilled; include mortar and accessories, structural backup, weather barrier, and wall insulation in mock-up.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

### 1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

### 1.12 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

## PART 2 PRODUCTS

### 2.1 BRICK UNITS

A. Facing Brick:
   1. Color and Texture: To match existing. Assume brick cost to be $600/1000.
   2. Adjustments to the cost will be made according to Section 01 26 00 - Contract Modification Procedures.

### 2.2 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M Type N.
   1. Mortar: To match existing mortar.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

C. Hydrated Lime: ASTM C207, Type S.

D. Water: Clean and potable.

### 2.3 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa) yield strength, deformed billet bars; galvanized.

B. Joint Reinforcement Type: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

C. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
   3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).

### 2.4 FLASHINGS

A. Combination Non-Asphaltic Flashing Materials - Stainless Steel:

1. Stainless Steel Flashing - Self-adhering: ASTM A240/A240M; 2 mil (0.05 mm) type 304 stainless steel sheet with 8 mil (0.20 mm) of butyl adhesive and a removable release liner.

B. Drip Edge: Stainless steel; compatible with membrane and adhesives.

### 2.5 ACCESSORIES

A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

### 2.6 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, Proportion Specification.
1. Masonry below grade and in contact with earth; Type S.
2. Exterior, non-loadbearing masonry; Type N.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

### 3.2 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Brick Units:
1. Bond: Match Existing.
2. Coursing: Three units and three mortar joints to equal 8 inches (200 mm).
3. Mortar Joints: Concave.

### 3.3 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar as work progresses.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

### 3.4 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches (400 mm) on center vertically and 24 inches (600 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

### 3.5 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

### 3.6 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).

C. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm in 1 m) and 1/4 inch in 10 ft (6 mm in 3 m); 1/2 inch in 30 ft (13 mm in 9 m).

E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).

## 3.7 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

## 3.8 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

**END OF SECTION**

# SECTION 05 40 00 - COLD-FORMED METAL FRAMING

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. Formed steel stud exterior wall framing.

### 1.2 RELATED REQUIREMENTS

A. Section 04 26 13 - Masonry Veneer: Veneer masonry supported by wall stud metal framing.

B. Section 06 10 00 - Rough Carpentry: Wall sheathing.

C. Section 07 21 00 - Thermal Insulation: Insulation within framing members.

D. Section 07 27 26 - Fluid-Applied Membrane Air Barriers.

E. Section 07 92 00 - Joint Sealants.

### 1.3 DEFINITIONS

A. General: See AISI S240 for definitions of terms used in this section.

B. Connection: A combination of structural elements and joints used to transmit forces between two or more members.

### 1.4 REFERENCE STANDARDS

A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

D. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).

### 1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to metal framing systems, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

### 1.6 SUBMITTALS

A. Refer to Section 01 30 00.0 - Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.

D. Product Data: Provide manufacturer's data on factory-made connectors and mechanical fasteners, showing compliance with requirements.

E. Manufacturer's Installation Instructions: Provide installation instructions for connectors.

F. Manufacturer's Qualification statement.

### 1.7 QUALITY ASSURANCE

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Manufacturer Qualifications:
   1. Company specializing in manufacturing the types of products specified in this section, and with minimum 3 years of documented experience.

### 1.8 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Provide mock-up of exterior framed wall, including components specified elsewhere, such as insulation, sheathing, exterior wall finish, and interior wall finish.

C. Locate where directed.

D. Mock-up may remain as part of the Work.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Structural Framing:
   1. CEMCO: www.cemcosteel.com/#sle.
   2. ClarkDietrich: www.clarkdietrich.com/#sle.
   3. Jaimes Industries: www.jaimesind.com/#sle.
   4. MarinoWARE: www.marinoware.com/#sle.
   5. MRI Steel Framing: www.mristeelframing.com/#sle.
   6. SCAFCO Corporation: www.scafco.com/#sle.
   7. Steel Construction Systems: www.steelconsystems.com/#sle.
   8. Super Stud Building Products, Inc: www.buysuperstud.com/#sle.
   9. Telling Industries: www.tellingindustries.com/#sle.
   10. The Steel Network, Inc: www.SteelNetwork.com/#sle.
   11. Substitutions: See Section 01 60 00 - Product Requirements.

B. Connectors:
   1. Same manufacturer as metal framing.

### 2.2 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with applicable building code criteria for loads, including seismic loads.

### 2.3 MATERIALS

A. Material and Product Requirements Criteria: AISI S201.

B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.

### 2.4 STRUCTURAL FRAMING COMPONENTS

A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.

### 2.5 CONNECTIONS

A. Performance Requirements: Provide connections in compliance with requirements of AISI S240.

B. Fixed Connections: Provide nonmovement devices for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

### 2.6 MISCELLANEOUS CONNECTIONS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated.

### 2.7 ACCESSORIES

A. Galvanizing Repair: Touch up bare steel with zinc-rich paint in compliance with ASTM A780/A780M.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

### 3.2 INSTALLATION - GENERAL

A. Install structural members and connections in compliance with ASTM C1007.

### 3.3 INSTALLATION OF STUDS

### 3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

### 3.5 TOLERANCES

### 3.6 SCHEDULES

**END OF SECTION**

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# SECTION 05 50 00 - METAL FABRICATIONS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References, are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to the following metal fabrications:
   1. Steel Weld Plates and Angles.

### 1.3 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

E. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for; 2025a.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

G. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2024.

H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

I. MFMA-4 - Metal Framing Standards Publication; 2004.

J. SSPC-PA 1 - Shop, Field, and Maintenance Coating of Metals; 2024.

K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

L. SSPC – Steel Structure Painting Council - Steel Structures Painting Council.

M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

N. ASTM A48/A48M – Standard Specification for Gray Iron Castings.

O. ASTM A283 – Carbon Steel Plates, Shapes, and Bars.

P. ASTM A385 – Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).

Q. ASTM A500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

R. ASTM A501 – Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

S. ASTM A513/A513M – Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

T. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

U. ASTM A1008/A1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

V. ASTM C1011/C1011M – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

W. ASTM F1941 – Standard Specification for Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric.

X. ASME B18.2.1 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series); 2012 (Reaffirmed 2021).

Y. ASME B18.6.3 - Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series); 13th Edition, 2017.

Z. AWS – Structural Welding Code.

## 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

## 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product data for products.

D. Shop drawings detailing fabrication and erection of each metal fabrication indicated.
   1. Include plans, elevations, sections, and details of metal fabrications and their connections.
   2. Show anchorage and accessory items.
   3. Provide templates for anchors and bolts specified for installation under other sections.

E. Delegated-Design Submittal: Submit design calculations for load bearing elements, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.

## 1.6 INFORMATION SUBMITTALS

A. Qualification Data: For qualified professional engineer.

B. Welder current certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

C. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project name, addresses, names of architects and owners, and other information specified.

D. Mill Certificates: Signed by manufacturers of stainless-steel certifying that products furnished comply with requirements.

E. Paint Compatibility: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

## 1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this Project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the Work.

B. Welding Standards: Comply with applicable provisions of AWS "Structural Welding Code."
   1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

C. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
   3. AWS D1.6, "Structural Welding Code - Stainless Steel."

D. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.

### 1.8 FIELD CONDITIONS

A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

### 1.9 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. 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.

### 1.10 PERFORMANCE

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

B. Delegated-Design Submittal: Contractor shall engage a qualified professional engineer, licensed in the State of Florida, to design calculations, analysis data, and shop drawings - indicating compliance with dedicated design requirements, and signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.

## PART 2 PRODUCTS

### 2.1 METALS, GENERAL

A. Metal Surfaces, General:
   1. Provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes.
   2. For metal fabrications exposed to view in the completed Work, do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

### 2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

### 2.3 FABRICATION, GENERAL

A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

C. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
   1. Temperature Change (Range): 100 deg F (55.5 deg C).

D. Shear and punch metals cleanly and accurately. Remove burrs.

E. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

F. 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 that no roughness shows after finishing, and contour of welded surface matches those adjacent.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds wherever possible. Use exposed fasteners of type indicated or, if not indicated, use Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

H. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

I. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for re-assembly and coordinated installation.

J. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

K. 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.

L. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

M. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

N. Form exposed work with accurate angles and surfaces and straight edges.

O. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

**2.4 ROUGH HARDWARE:**

A. Furnish bent, or otherwise custom-fabricated, bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 06 Sections.

B. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts that bear on wood structural connections, and furnish steel washers elsewhere.

## 2.5 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

## 2.6 FASTENERS/ANCHORS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
   1. Provide stainless-steel fasteners for fastening aluminum.

B. Steel Bolts and Nuts:
   1. Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and where indicated, flat washers.
   2. Regular hexagon-head bolts, ASTM A 325, Type 3; with hex nuts, ASTM A 563, Grade C3; and where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 2.

D. Screws:
   1. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).
   2. Lag Screws: ASME B18.2.1 (ASME B18.2.3.8M).

E. Washers:
   1. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).
   2. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

F. Anchors:
   1. General:
      a. 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.
      b. Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
   2. Post-Installed Anchors: Torque-controlled expansion anchors.
      a. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
      b. (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
   3. Anchor Bolts:
      a. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
         1) Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

## 2.7 MISCELLANEOUS FRAMING AND SUPPORTS

A. Provide miscellaneous steel framing and supports not specified in other Sections as needed to complete the Work.

B. Cut, drill, and tap units to receive hardware, hangers, and similar items.

C. 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. Equip units with integrally welded anchors for casting into concrete or building into masonry.
   2. Furnish inserts if units must be installed after concrete is placed.
   3. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.
   4. Fabricate units from slotted channel framing where indicated.

**2.8 ACCESSORIES**

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for the metal alloy to be welded.

**2.9 FINISHES, GENERAL**

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. All sections, including Aluminum surfaces, shall be free of scratches and other serious surface blemishes and chemically cleaned.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Finish metal fabrications after assembly.

E. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

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

**2.10 FINISHES, STEEL AND IRON**

A. Prepare surfaces to be primed in accordance with SSPC SP 2.

B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

C. Do not prime surfaces in where field welding is required.

D. Interior Steel Members: Prime paint items with one coat.

E. Exterior Steel Members:
   1. Galvanize after fabrication to ASTM A123/A123M.
   2. Provide minimum G90 galvanized coating.
   3. Paint per specification sections Interior Painting and Exterior Painting.
   4. Exterior exposed steel scheduled to be painted if not galvanized.

F. Paint
   1. 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.
   2. Shop Primers: Provide primers that comply with Division 09 painting Sections.
      a. Provide products by listed manufacturers. However, products of other manufacturers will be considered for acceptance, provided they equal or exceed the material requirements and functional qualities of the specified product, and approval in writing by the Architect is obtained prior to bidding.
         1) Carboline.
         2) Ameron.

(a) Basis of Design Product:
(1) Tnemec Tneme-Zinc 90-97 or equal.
(2) Epoxy Zinc-Rich Primer: Complying with MPI #20 (Zinc Rich, Epoxy), and compatible with topcoat.

3. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
   a. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   b. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   c. Items Indicated to Receive Primers Specified in Division 09 Section "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   d. Other Items: SSPC-SP 3, "Power Tool Cleaning."
4. 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.
   a. Stripe paint corners, crevices, bolts, welds, and sharp edges.
5. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.
6. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M, formulated for 30-mil thickness per coat.
7. Coordinate standard shop primers normally provided with the finish paint specifications for these items in Painting specifications. Metal fabricator will be required to provide the primers as specified in Painting specifications. All items scheduled to receive finish coats as specified in Painting specifications shall be prepared for primer in accordance with SSPC - SP 6, Commercial Blast Cleaning, or SSPC - SP3, Power Tool Cleaning, as recommended by the manufacturer for the types of primers installed.

G. Stainless Steel: #4 Satin.

### 2.11 FINISHES, MISCELLANEOUS

A. Miscellaneous Framing and Supports:
1. Galvanize miscellaneous framing and supports in exterior walls.

## PART 3 EXECUTION

### 3.1 INSPECTION

A. Installer must examine the areas and conditions under which miscellaneous and ornamental items are to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

### 3.2 PREPARATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

### 3.3 INSTALLATION, GENERAL

A. Fastening to In-Place Construction:
1. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and

elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop-welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

E. Field Welding:
   1. Comply with the following requirements:
      a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
      b. Obtain fusion without undercut or overlap.
      c. Remove welding flux immediately.
      d. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

## 3.4 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

## 3.5 ADJUSTING AND CLEANING

A. Touchup Painting:
   1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint.
   2. Paint uncoated and abraded exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
   3. Apply by brush or spray, to provide a 2.0-mil minimum dry film thickness.

B. Touchup Painting:
   1. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint is specified in Division 09 painting Sections.

C. Galvanized Surfaces:
   1. Clean welds, bolted connections, and abraded areas.
   2. Apply galvanizing repair paint to comply with ASTM A780.

## 3.6 WASTE MANAGEMENT

A. Collect cutoffs and scrap and place in designated areas for recycling.

B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

**END OF SECTION**

# SECTION 06 10 00 - ROUGH CARPENTRY

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Sheathing.

B. Concealed wood blocking, nailers, and supports.

C. Miscellaneous wood nailers, furring, and grounds.

### 1.3 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2024.

D. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

F. ALSC (American Lumber Standards Committee) – Softwood Lumber Standards.

G. EWA (The Engineered Wood Association).

H. APA (American Plywood Association).

I. AWPA U1 – Use Category System - User Specification for Treated Wood.

J. AWPA P5 – Standard for Waterborne Preservatives.

K. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2003.

L. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.

M. ICC-ES Standards.

N. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.

O. PS 1 - Structural Plywood; 2023.

P. PS 2 - Performance Standard for Wood Structural Panels; 2019.

Q. PS 20 - American Softwood Lumber Standard; 2025.

### 1.4 REFERENCES:

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

D. 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.

### 1.6 INFORMATION SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:
   1. Wood-preservative-treated wood.

### 1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

### 1.8 FIELD CONDITIONS

A. Examine substrates and supporting structure and the conditions under which work is to be installed. Do not proceed with the installation until unsatisfactory conditions have been corrected.

### 1.9 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
   1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.
   2. Keep treated wood waste separated from other wood to be recycled or reused as mulch. Discard in a legal manor.

## PART 2 PRODUCTS

### 2.1 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

### 2.2 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. General:
   1. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including blocking, nailers, and similar items.
   2. Lumber for blocking may be any grade and classified standard and better for western species or classified No. 2 for Southern Pine SPIB. Plywood shall not be used for blocking materials.

3. Provide lumber for support or attachment of other construction including rooftop equipment curbs and support bases, grounds, and similar members.
4. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
5. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
6. Wood grounds, nailers, and sleepers shall be pressure treated as specified herein. The manufacturer and applicator of pressure treatment shall mark all wood.
7. No wood grounds, nailers, blocking and sleepers shall be permitted inside the building, unless indicated otherwise.

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S4S, No. 2 or Standard Grade.
2. Boards: Standard or No. 3.

## 2.3 CONSTRUCTION PANELS

A. General:
1. Construction and Industrial Plywood" for plywood construction panels and, for products not manufactured under PS 1 provisions, with APA PRP-108. Furnish construction panels that are each factory-marked with APA trademark. Furnish construction panels that are each factory-marked with APA trademark.
a. Panels: Exterior AC plywood 1/2" and 3/4' as indicated on the drawings.

B. Wall Sheathing: Glass mat faced gypsum, ASTM C1177/C1177M, 5/8 inch Type X fire resistant (16 mm Type X fire resistant).
1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
2. Edges: Square.
3. Products:
a. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.
b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Other Applications:
1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
3. Other Locations: PS 1, C-D Plugged or better.

## 2.4 ACCESSORIES

A. Metal and Finish of Fasteners:
1. Untreated Wood: Unfinished steel.

# PART 3 EXECUTION

## 3.1 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

D. Protect treated wood from the weather. Store according to the manufacturer's recommendations.

## 3.2 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

F. Install permanent grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

G. Provide nonstructural framing and blocking to support the following:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Grab bars.
   4. Towel and bath accessories.
   5. Wall-mounted door stops.
   6. Toilet partitions and urinal screens
   7. Joints of rigid wall coverings that occur between studs.
   8. Other wall- or ceiling-mounted items indicated on drawings.

## 3.3 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

## 3.4 TOLERANCES

A. Framing Members: 1/4 inch (6 mm) from true position, maximum.

B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

## 3.5 CLEANING

A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

**END OF SECTION**

# SECTION 06 20 00 - FINISH CARPENTRY

## PART 1 GENERAL

### 1.1 1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Finish carpentry items.

B. Hardware.

C. Miscellaneous plastic laminate.

D. Miscellaneous clad items.

E. Plywood at interior of exterior opening closures.

F. Installation of:
   1. Toilet room accessories.
   2. Plywood at interior of exterior wall opening closures.
   3. New plastic laminate clad wood caswork.
   4. Solid surface countertops and vanity tops.

### 1.3 REFERENCE STANDARDS

A. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.

B. ANSI A208.1 - American National Standard for Particleboard; 2022.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

D. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

E. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

F. NHLA G-101 - Rules for the Measurement and Inspection of Hardwood and Cypress; 2023.

G. PS 1 - Structural Plywood; 2023.

H. PS 20 - American Softwood Lumber Standard; 2025.

### 1.4 4 REFERENCES:

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

### 1.6 SUBMITTALS

A. Refer to Section 01 30 00.0 - Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data:
   1. Provide instructions for attachment hardware and finish hardware.

D. Samples: Submit two samples of each species of specified wood trim.

E. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.

### 1.7 QUALITY ASSURANCE

A. Grade materials in accordance with the following:
   1. Softwood Lumber: In accordance with rules certified by ALSC; www.alsc.org.
   2. Plywood: Certified by the American Plywood Association.
   3. Hardwood Lumber: In accordance with NHLA Grading Rules; www.natlhardwood.org.

B. Quality Standards: Except as otherwise shown or specified, comply with specified provisions of the Architectural Woodwork Institute (AWI) "Quality Standards."

C. Optimum Moisture Content: Kiln-dry woodwork to an average moisture content within the following ranges or as otherwise recommended by applicable Quality Standards for the regional climatic conditions involved.
   1. Interior woodwork – 5 to 10 percent.
   2. Exterior woodwork – 19 percent maximum.

D. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.

E. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.

### 1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect from moisture damage.

B. Handle materials and products to prevent damage to edges, ends, or surfaces.

## PART 2 PRODUCTS

### 2.1 FINISH CARPENTRY ITEMS

A. Unless otherwise indicated provide products of quality specified by AWI Architectural Woodwork Quality Standards Illustrated for Premium grade.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

### 2.2 LUMBER MATERIALS

A. Lumber fabricated from old growth timber is not permitted.

B. Hardwood Lumber: ash species, quarter sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
   1. Finish: Shop finish clear lacquer.
   2. Grading: In accordance with NHLA G-101 Grading Rules; www.nhla.com.
      a. Grade: A.

C. Interior Material
   1. General: Provide materials that comply with requirements of the AWI Woodworking Standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:
   2. Softwood Plywood: PS 1.
   3. Hardwood Plywood and Face Veneers: HPVA HP-1.
   4. Lumber: PS 20.
   5. High Pressure Laminate: NEMA LD3.
   6. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:

a. Hardwood Plywood: HPMA FE

## 2.3 MISCELLANEOUS LAMINATE CLAD ITEMS

A. Laminate clad casework shall comply with custom grade quality standards as set forth in AWI, Section 400, Division 400B, "Laminate Clad Cabinets."

B. High Pressure Plastic Laminate (for miscellaneous millwork and paneling items).
   1. Plastic laminate except backing or balancing sheets shall be high pressure laminate conforming to NEMA LD-1985. Color shall be selected by the Architect from the full line of standard colors.
   2. Exposed Horizontal Surfaces: Shall be nominal .048 inch thick minimum with textured finish and conforming to NEMA standards for HGS horizontal grade.
   3. Exposed and Semi-Exposed, Interior and Exterior Vertical Surfaces: Shall be .028 inch thick minimum with low lustre textured finish and conforming to NEMA standards for VGS vertical grade.
   4. Backing Sheet for Concealed Surfaces: Shall be .028 or .020 inches thick, conforming to NEMA standards for VGS vertical grade or CL20 cabinet liner.
   5. Backing Sheet for Semi-Exposed Surfaces: Shall be .028 inches thick, conforming to NEMA standards for VGS vertical grade. Use to balance face laminate.
   6. Paneling (Plastic Laminate on Plywood): Shall be .048 conforming to HGS for face and all exposed edges.

C. Plastic laminate color shall be as selected by the Architect.

D. Manufacturer is as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
   1. Formica Corporation
   2. Laminart
   3. Nevamar Corp.
   4. Pioneer Plastics Corp.
   5. Arborite, Forbo
   6. Wilsonart

## 2.4 SHEET MATERIALS

A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

B. Softwood Plywood, Exposed to View: Face species Paint grade birch, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.
   1. Grading: Certified by the American Plywood Association.

## 2.5 ADHESIVE

A. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

## 2.6 FASTENINGS

A. Fasteners: Of size and type to suit application; black oxide finish in concealed locations and stainless steel finish in exposed locations.

B. Concealed Joint Fasteners: Threaded steel.

C. Fasteners for wood plank siding and paneling: Philips type, oval head, stainless steel #10 wood screws.

D. Concealed cleat fastening: Aluminum extruded paired cleats - 1/4" thick.

## 2.7 ACCESSORIES

A. Lumber for Shimming, Blocking, and support: Softwood lumber of any species.

B. Primer: Alkyd primer sealer.

C. Wood Filler: Solvent base, tinted to match surface finish color.

**2.8 HARDWARE**

**2.9 FABRICATION**

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Fit exposed sheet material edges with 3/8 inch matching hardwood (9 mm matching hardwood) edging. Use one piece for full length only.

C. Cap exposed plastic laminate finish edges with aluminum trim.

D. Shop prepare and identify components for book match grain matching during site erection.

E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

F. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs. (Locate counter butt joints minimum 600 mm from sink cut-outs.)

G. Apply laminate backing sheet to reverse face of plastic laminate finished surfaces.

H. Fabricate wood plank siding and paneling with a 1/4" radius on all edges. Pre-drill and countersink all fasteners. Join all edges for tight fitting joints with maximum gaps between planks of 1/32".

**PART 3 EXECUTION**

**3.1 EXAMINATION**

A. Verify adequacy of backing and support framing.

B. Coordinate backing requirements for all paneling and trim.

**3.2 INSTALLATION**

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

**3.3 CLEANING:**

A. Dispose of all waste material in compliance with project's Waste Management Plan in accordance with Section 01 56 00 - Construction Waste Management and Disposal.

**3.4 TOLERANCES**

A. Maximum Variation from True Position: 1/16 inch (1.6 mm).

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

**END OF SECTION**

# SECTION 06 41 00 - ARCHITECTURAL WOOD PLAM CASEWORK

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Wood casework with laminate cladding.

B. Plastic laminate counter tops.

C. Cabinet and drawer hardware.

### 1.3 REFERENCE STANDARDS

A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).

B. ANSI A208.1 - American National Standard for Particleboard; 2022.

C. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.

D. ANSI/AWI 0400 - Factory Finishing; 2022.

E. ANSI/AWI 0620 - Finish Carpentry/Installation; 2024.

F. ANSI/AWI 0641 - Architectural Wood Casework; 2019.

G. AWI 300 - Materials; 2018.

H. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

I. BHMA A156.9 - Cabinet Hardware; 2020.

J. ISO 4586-3 - High-Pressure Decorative Laminates (HPL, HPDL) – Sheets Based on Thermosetting Resins (Usually Called Laminates) – Part 3: Classification and Specifications for Laminates Less than 2 mm Thick and Intended for Bonding to Supporting Substrates; 2018.

K. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

### 1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work of this section with installation of wood blocking, wood backing, and other anchorage that provides casework backing and structural support.
   2. Coordinate work of this section with rough-in plumbing and rough-in electrical integrally-related with casework.

B. Preinstallation Meeting: Convene preinstallation meeting not less than one week prior to completion of framing behind casework; require attendance of contractor, framing contractor, and casework fabricator.
   1. Review locations of casework backing and structural support.
   2. Review backing attachment method to wall framing as indicated on drawings.

### 1.5 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.6 SUBMITTALS

A. Shop Drawings:
   1. General: Each sheet sequentially numbered and dated.
      a. Sheet Size: 11 by 17 inches (280 by 430 mm).
      b. Contents: Indicate project name and project address.

2. AWI QCP Program Shop Drawing Requirements:
3. Reference Plans: Casework locations in relative context of building floor plans.
4. Plans and Elevations: Plan and elevation views of each assembly type.
   a. Include rough opening dimensions and casework assembly dimensions
5. Detailed Section: Dimensioned section views of each casework configuration.
   a. Include appropriate locations for casework wall anchorage.
6. Details: Dimensioned casework assembly details with material thicknesses.
   a. Include laminate-clad panels and panel cores.

B. Samples:
   1. Samples, Laminate-Clad Panels: For each laminate-clad type, submit two, laminate-clad sample panels; size: 8 by 8 inches (200 by 200 mm); thickness: 3/4 inch (19 mm).
   2. Samples, Laminates: For each laminate type, submit two samples for each specified color.
   3. Samples, Hardware: For each hinge, pull, and cabinet lock type, submit one sample, full-size, indicating specified finish.

C. Refer to Section 01 30 00 – Administrative Requirements for submittal requirements.

D. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

E. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

### 1.7 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Firm specializing in fabricating and installing products specified in this section with minimum five years of documented experience; with qualifications indicating ability to comply with requirements of this section.
   1. Woodworking company with at least one project in past five years with value of casework within 20 percent of casework cost for this project.

### 1.8 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Store products prior to installation on flat, level, clean surfaces; elevate products above floors and protect from sunlight.

C. Store products in interior rooms with completed wet work and overhead work.

D. Store non-wood-based products under cover and elevated above grade.

E. Handle materials and products to prevent damage to edges, ends, or surfaces.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. EGGER: www.egger.com/#sle.

B. PoliLam: www.polilam.com/#sle.

C. Formica Corporation: www.formica.com/#sle.

D. Wilsonart.

E. Substitutions: See Section 01 60 00 - Product Requirements.

F. Single Source Responsibility: Provide and install this work from single fabricator.

### 2.2 PERFORMANCE REQUIREMENTS

A. Architectural Woodwork Institute (AWI) Performance Requirements:
   1. Comply with AWI 300, ANSI/AWI 0641, ANSI/AWI 0400, and ANSI/AWI 0620 as applicable for specified casework finish, aesthetic grade, and performance duty level.

a. Aesthetic Grade: Premium.
b. Product Performance Duty Level: Duty Level 4.

2. Panel and Material Thicknesses: Provide panels and materials as required to meet specified performance duty level, subject to minimum thickness requirements of AWI 300 and ANSI/AWI 0641 and flatness requirements indicated below.
3. Panel Flatness: Provide panels with maximum variation from flat in 12 inches (300 mm) as measured diagonally across panel.
   a. Premium Grade: Plus or minus 0.063 inch (1.6 mm) maximum.
4. Cabinet Door Flatness:
   a. Comply with specified performance requirements.

## 2.3 WOOD CASEWORK WITH LAMINATE CLADDING

A. Casework Construction:
   1. Frameless Cabinet and Door Interface: Flush overlay.
   2. Door and Drawer Front Profile: Flush.

B. Premium Grade - Laminate-Clad Wood Casework:
   1. Exposed Exterior Surfaces, Panels to Receive Laminate Cladding:
      a. HPDL Panels; Surface Finish: As specified.
   2. Exposed Interior Door and Drawer Front Surfaces:
      a. Same laminate materials and thicknesses as exposed exterior surfaces.
         1) Color to match color of semi-exposed surfaces.
   3. Exposed Interior Surfaces Except at Door and Drawer Front Surfaces:
      a. HPDL Panels: As specified.

C. Edgebanding Applications for Laminate-Clad Wood Casework:
   1. Drawer Box Top Edges:
      a. Visible Cores: Not permitted.

D. Edgebanding Materials for Laminate-Clad Wood Casework:
   1. HPDL: Match exposed surfaces.

## 2.4 HPDL-CLAD PANELS

A. Description: Panels consisting of High-Pressure Decorative Laminate (HPDL) faces applied to cores; panel layup with face ply, back ply, and core of either single ply or odd number of inner plies, to produce balanced construction panel.

B. High-Pressure Decorative Laminate (HPDL): Sheet consisting of fibrous material impregnated with thermosetting resins; bonded by high-pressure process.

C. HPDL Laminates Less than 0.08 inch (2 mm) Thick: Comply with ISO 4586-3.
   1. Products:
      a. Arborite: www.arborite.com/#sle.
      b. Formica Corporation: www.formica.com/#sle.
      c. Panolam Industries International, Inc: www.panolam.com/#sle.
      d. Wilsonart LLC: www.wilsonart.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.5 PANEL CORES

A. Provide casework plywood cores of hardwood plywood "Veneer Core" Grade AA, with no added Urea Formaldehyde adhesives.
   1. Use 3/4 inch thick, closed-grain hardwood plywood typical unless noted otherwise.

B. At sink base cabinets, and countertops and backsplashes within 36 inches of sinks, use 3/4 inch specially designed Marine Grade Plywood made entirely of Douglas-fir or Western Larch. The grade of all plies of veneer is B or better. Exposure rating is exterior and glue used is fully waterproof structural adhesive.

### 2.6 CABINET AND DRAWER HARDWARE

A. Hinges, Number of Hinges for Each Cabinet Door:

B. Hinges, Self-Closing, Integrated Damper Hinges:
   1. Description: Self-closing hinges with integrated damper mechanisms.
   2. Material and Finish: Satin anodized aluminum.
   3. Products:
      a. Blum, Inc; CLIP top BLUMOTION: www.blum.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cabinet Door and Drawer Knobs:
   1. Provide one knob for each swinging door.
   2. Provide one knob for each drawer 24 inches (610 mm) or less in width.
   3. Provide two knobs for each drawer over 24 inches (610 mm) in width.
   4. Mounting: Back-mounted.
   5. Design: To match existing.
   6. Material and Finish: To match existing.

D. Drawer Slides:
   1. Mounting: Side-mounted self-closing.
   2. Travel: Full extension.
   3. Material and Finish: Satin anodized aluminum.

E. Cabinet Door and Drawer Silencers:
   1. Description: Self-adhesive rubber silencers.
   2. Doors, Quantity: One silencer at top and bottom of closing edge of each door.
   3. Drawers, Quantity: One silencer at back side of each drawer front cover.
   4. Size: 1/4 inch (6.4 mm) diameter; 1/8 inch (3.2 mm) projection.
   5. Color: As selected from manufacturer's standards.

F. Cabinet Door Keyed Locks with Dead Bolts:
   1. Keying Action: Key projects and retracts dead bolts.
   2. Mounting: Half-mortised into back of door.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify casework and materials required for installation have been delivered, handled and stored as specified.

B. Verify wood blocking that provides casework backing is installed as indicated on drawings.

C. Verify location and sizes of rough-in plumbing and rough-in electrical associated with work of this section.

### 3.2 INSTALLATION

A. Install and secure work of this section in accordance with specified performance requirements.

B. Install scribe fillers to close gaps between casework and adjacent walls.

C. Caulk all cabinets and countertops to adjacent wall surfaces.

### 3.3 ADJUSTING

A. Adjust hardware for smooth operation in accordance with hardware manufacturer's documented instructions.

### 3.4 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean exposed surfaces of casework, shelving, and hardware.

**END OF SECTION**

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# SECTION 07 21 00 - THERMAL INSULATION

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Glass-fiber batt.

### 1.3 DEFINITIONS

A. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.
   1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
   2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
   3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

### 1.4 REFERENCE STANDARDS

A. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.

B. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2025.

C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

D. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2024.

E. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2026.

### 1.5 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.6 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

D. Product Test Reports: For each product, for tests performed by a qualified testing agency.

E. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

### 1.7 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

### 1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Insulation Protection: Do not expose to sunlight except to necessary extent for period of installation and concealment. Protect against ignition at all times and do not deliver materials to project site before installation time.

### 1.9 WARRANTY

A. Provide written warranty from the manufacturer that the actual thermal resistance of the extruded polystyrene insulation will not vary by more than 10% from its published thermal resistance.

B. Warranty period is fifteen (15) years from the date of Substantial Completion.

### 1.10 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

## PART 2 PRODUCTS

### 2.1 APPLICATIONS

A. Insulation in Metal Framed Walls: Batt insulation with no vapor retarder.

### 2.2 MINERAL FIBER BLANKET INSULATION MATERIALS

A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit, Type I.
   1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   2. Formaldehyde Content: Zero.
   3. Products:
      a. CertainTeed Corporation: www.certainteed.com/#sle.
      b. Johns Manville: www.jm.com/#sle.
      c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.owenscorning.com/en-us/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements for substitution procedures.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

### 3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to rain at any time.

C. Extend insulation to envelop entire building to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

### 3.3 BATT INSTALLATION

A. Install in exterior wall spaces without gaps or voids. Do not compress insulation.

B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

C. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

### 3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

### 3.5 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

### 3.6 WASTE MANAGEMENT

A. Collect cutoffs and scrap and place in designated areas for recycling.

B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

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# SECTION 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIERS

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. Fluid-applied membrane air barriers.

### 1.2 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Exterior metal stud walls.

B. Section 06 10 00 - Rough Carpentry: Exterior sheathing.

C. Section 07 92 00 - Joint Sealants: Sealants applied to adjacent work.

### 1.3 DEFINITIONS

A. Air Barrier: Airtight barrier made of material that is relatively air impermeable but water vapor permeable, both to degree specified, with sealed seams and with sealed joints to adjacent surfaces.

### 1.4 REFERENCE STANDARDS

A. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

B. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

C. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2025.

### 1.5 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.6 SUBMITTALS

A. Refer to Section 01 30 00.0 - Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Provide data on material characteristics, performance criteria, and limitations.

D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

E. Manufacturer's qualification statement.

F. Installer's qualification statement.

### 1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

### 1.8 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Provide mock-up of air barrier assembly,

C. Locate as directed by Architect.

D. Mock-up may remain as part of work.

### 1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in original packaging with seals unbroken and properly labeled.

B. Store materials in their original undamaged packaging within clean, dry, and protected location at a temperature less than 90 degrees F (32 degrees C).

### 1.10 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturer before, during, and after installation.
   1. Do not apply air barrier products when air or substrate temperatures are above 100 degrees F (38 degrees C) or below 20 degrees F (minus 6 degrees C).
   2. Allow wet substrates to dry prior to applying air barrier products.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Fluid-Applied Membrane Air Barrier:
   1. Dow: www.dow.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.2 FLUID-APPLIED MEMBRANE AIR BARRIER ASSEMBLY

A. Applications:
   1. Exterior Sheathing on Steel Stud Walls:
      a. See Section 05 40 00 for steel studs.
      b. See Section 06 10 00 for exterior sheathing.
      c. See Section 07 92 00 for joint sealants applied to adjacent work.

B. Fluid-Applied Membrane Air Barrier: Single-component, vapor permeable, 100 percent silicone elastomeric air barrier.
   1. Dry Film Thickness (DFT): 15 mils, 0.015 inch (0.381 mm), minimum.
   2. Air Permeance: 0.004 cfm/sq ft (0.02 L/sec sq m) maximum leakage when tested at 1.57 psf (75 Pa) pressure difference in accordance with ASTM E2178.
   3. Vapor Permeance: 10 perms (574 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Desiccant Method at 73.4 degrees F (23 degrees C).
   4. Air Barrier Leakage: Not greater than 0.04 cfm/sq ft (0.2 L/sq m) of surface area at pressure of 1.57 psf (75 Pa) when tested in accordance with ASTM E2357.
   5. Products:
      a. Dow; DOWSIL DefendAir 200C: www.dow.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.3 ACCESSORIES

A. Thinners and Cleaners: As recommended by material manufacturer.

B. Crack Fillers: Provide substrate manufacturer's recommended crack fillers or sealants compatible with air barrier assembly components and adjacent materials.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that surfaces and conditions are ready to accept work of this section.

B. Verify that surfaces are clean, dry, and free of frost, dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, excess alkalinity, and other conditions affecting performance of this work.

C. Proceed with work once conditions comply with air barrier coating manufacturer's recommendations.

### 3.2 PREPARATION

A. Protect work of other trades against damage from application of air barrier coatings.

B. Protect adjacent surfaces not designated to receive air barrier coatings; provide protection for pedestrians, vehicles, landscaping, and surrounding areas to prevent contact with coating materials.

C. Clean substrates to remove contaminants and foreign material by pressure cleaning, wire brushing, grinding or other method recommended by air barrier coatings manufacturer.

D. Prepare substrates in accordance with air barrier coating manufacturer's written instructions.

E. Repair deteriorated or damaged substrates, repair masonry joints, and fill cracks, voids, honeycombs, and other defects using materials as recommended by air barrier coating manufacturer, and allow patching materials to fully cure.
   1. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
   2. Fill cracks larger than 1/16 inch (1.6 mm) wide using applicable joint sealant, and fill cracks larger than 1 inch (25.4 mm) wide using joint sealant and compatible bond breaker where movement is expected.

## 3.3 APPLICATION

A. Apply air barrier system materials in accordance with manufacturer's instructions.

B. Transition Strips and Silicone Sealants: Install with approved sealants in accordance with manufacturer’s written instructions.
   1. Form sealed joints to windows, wall framing systems, door and louver frames, roofing system perimeters, and at interface with other adjacent materials utilizing compatible components that form air barrier assembly.

C. Air Barrier Coating: Apply air barrier coating using application methods and rate of application recommended by manufacturer, using nap roller or airless sprayer, in accordance with requirements of authorities having jurisdiction (AHJ).
   1. Provide wet application not less than 30 mils, 0.030 inch (0.76 mm) thick, or more as required by substrate conditions, with dry film thickness (DFT) not less than 15 mils, 0.015 inch (0.38 mm) thick.

## 3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Do not cover installed air barriers until required inspections have been completed.

## 3.5 CLEANING

A. During completion of this work, remove overspray and excess material, using materials and methods approved by manufacturer that will not damage adjacent materials.

B. Clean and repair adjacent surfaces damaged by air barrier coating application.

## 3.6 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

B. Allow air barrier coatings to fully cure before exposure to traffic or other construction operations.

**END OF SECTION**

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# SECTION 07 72 00 - ROOF ACCESSORIES

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Equipment rail wear pads

### 1.3 REFERENCE STANDARDS

A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2026.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

E. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

G. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

J. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2024.

K. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Rerquirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

### 1.6 ACTION SUBMITTALS

A. Refer to Section 01 30 00 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: For each type of roof accessory.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

## PART 2 PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

### 2.2 ROOF EQUIPMENT SUPPORT PADS

A. Provide a minimum of one layer of compatible roofing material under each new equipment/piping rails/supports.

B. Wear pad to be adhered to existing roofing membrane using method approved by existing roofing manufacturer.

### 2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for complete installation.

### 2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

### 3.3 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION 077200**

# SECTION 07 84 00 - FIRESTOPPING

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

### 1.3 REFERENCE STANDARDS

A. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

B. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

C. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.

D. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2024.

E. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2024.

F. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2024.

G. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

### 1.4 REFERENCES:

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

D. Product Data: Provide data on product characteristics, performance ratings, and limitations.

E. Shop Drawings:
   1. Submit shop drawings showing layout, profiles, and product components.
   2. Include Independent laboratory with system classification number on shop drawings.

F. Certification from sealant manufacturers that their products are suitable for the use indicated and comply with specification requirements.

G. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

H. Certificate from authority having jurisdiction indicating approval of materials used.

I. Manufacturer's qualification statement.

### 1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of penetration firestopping.

## 1.7 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

D. Applicator Qualifications:
   1. Applicator shall have at least 3 years' experience in installing materials of types specified and shall have successfully completed at least 3-projects of similar scope and complexity.
   2. Manufacturer approved applicator.
   3. Applicator shall designate a single individual as project supervisor who shall be on site at all times during installation.

E. Single source responsibility for firestopping materials:
   1. Obtain Firestop materials from single manufacturer for each different product required.
   2. Manufacturer shall instruct applicator in procedures for each material.

F. Regulatory Requirements:
   1. Firestop System installation shall meet requirements of ASTM E-814 and provide a fire rating equal to that of the construction it penetrates.
   2. Proposed Firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
   3. For those Firestop applications not having an UL or third party tested system available through any manufacturer.
      a. Prior to installation the manufacturer may submit to the authorities having jurisdiction for their consideration an engineering judgment derived from similar independently tested system of similar design.
      b. Manufacturer’s engineering judgment drawings must follow requirements set forth by the International Firestop Council.

## 1.8 PRE-INSTALLATION MEETINGS

A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

## 1.9 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

## 1.10 SYSTEM DESCRIPTION

A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.

B. F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated as determined per ASTM E814, UL 1479 but not less than that equaling or exceeding the fire resistance rating of the constructions penetrated.

C. T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas. T-rated assemblies are required where specified by codes or where the following conditions exist:
   1. Where firestop systems protect penetrations located outside of wall cavities.
   2. Where firestop systems protect penetrations located outside fire resistive shaft enclosures.
   3. Where firestop systems protect penetrations located in construction containing doors required to have a temperature rise rating.
   4. Where firestop systems protect penetrating items larger than a 4-inch diameter nominal pipe or 16 square inch in overall cross-sectional area.

D. Fire Resistive Joint Sealants: Provide joint sealants with fire resistance ratings indicated, as determined per ASTM E119, UL 1479 and UL 2079 but not less than that equaling or exceeding the fire resistance rating of the construction in which the joint occurs.

E. For firestopping exposed to traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions and will meet load requirements.
   1. For piping penetrations for plumbing and wet pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
   2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
   3. For penetrations involving insulated piping, provide through-penetration firestop systems not required removal of insulation.

F. For through-penetration firestop systems exposed to view, provide products with flame spread of less than 25 and smoke developed ratings of less than 450, as determined per ASTM E 84.

G. Firestopping Materials: ASTM E119, ASTM E814, UL 263 or UL 1479 to achieve fire rating.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Firestopping Manufacturers:
   1. 3M Fire Protection Products.
   2. Hilti, Inc
   3. Specified Technologies Inc
   4. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic.

B. Substitutions: See Section 01 60 00 - Product Requirements for substitution procedures.

### 2.2 MATERIALS

A. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

### 2.3 FIRESTOPPING, GENERAL

A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
   1. All materials shall comply with ASTM E814 or E119 (UL 1429), and shall be manufactured of non-toxic, non-hazardous, asbestos free materials, and unaffected by water or moisture when cured.
   2. Primers: Conform to manufacturer’s recommendations for primers required for various substrates and conditions.
   3. Backup Materials: Backup materials, supports, and anchoring devices shall be provided as required by UL testing.

B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated systems. Accessories include but are not limited to the following items:
   1. Permanent forming/damming/backing materials must be noncombustible and may include the following:
      a. Semi-refractory fiber (mineral wool) insulation.
      b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
      c. Joint fillers for joint sealants.
   2. Temporary forming materials.
   3. Substrate primers.
   4. Collars.
   5. Steel sleeves.

C. Use only firestopping products that have been UL 1479 or ASTM E814 tested for specific fire rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire rating involved for each separate instance.

## 2.4 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
   1. Fire-resistance-rated walls include fire walls fire-barrier walls smoke-barrier walls and fire partitions.
   2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
   1. Horizontal assemblies include floors floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
   2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
   3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
   1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.

E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.

F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

G. Provide components for each penetration firestopping system that are needed to install fill materials and to maintain required ratings. Use only those components specified by penetration

firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

1. Permanent forming/damming/backing materials, including the following:
   a. Slag-wool-fiber or rock-wool-fiber insulation.
   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
   c. Fire-rated form board.
   d. Fillers for sealants.
2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

### 2.5 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

### 2.6 ENVIRONMENTAL

A. Data: Submit manufacturer’s product data for sealants. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

B. Certification: Submit manufacturer’s certification that products comply with Bay Area Resources Board, reg. 8, rule 51.

C. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
   1. Architectural Sealants: 250 g/L.
   2. Sealant Primers for Nonporous Substrates: 250 g/L.
   3. Sealant Primers for Porous Substrates: 775 g/L.

### 2.7 FIRESTOPPING SYSTEMS

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify openings are ready to receive the work of this section.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to prevent liquid material from leakage.

D. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

E. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

## 3.3 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Install labeling required by code.

C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

D. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

E. Install fill materials for firestopping by proven techniques to produce the following results:

F. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

1.

2. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

## 3.4 IDENTIFICATION

A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage”.
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

## 3.5 FIELD QUALITY CONTROL

A. Independent Testing Agency: Inspection agency employed and paid by Owner, will examine penetration firestopping in accordance with ASTM E2174 and ASTM E2393.

B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

## 3.6 CLEANING

A. Clean adjacent surfaces of firestopping materials.

## 3.7 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

# SECTION 07 92 00 - JOINT SEALANTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

### 1.3 REFERENCE STANDARDS

A. ACI 504 R – Guide to Joint Sealants for Concrete Structures.

B. ASTM D1056 – Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

C. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2024.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

G. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2025).

H. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber; 2020.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

J. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

K. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 ACTION SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
2. List of backing materials approved for use with the specific product.
3. Backing material recommended by sealant manufacturer.
4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
5. Substrates the product should not be used on.
6. Substrates for which use of primer is required.
7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.

8. Sample product warranty.
9. Certification by manufacturer indicating that product complies with specification requirements.

D. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

E. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

## 1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

C. Compatibility with CPVC Piping:
1. Certain sealants are not compatible with CPVC piping and can cause corrosion with piping. Sealants used for openings penetrated by CPVC piping shall be approved by piping manufacturer and documentation shall be submitted verifying that proposed sealant is approved by the respective CPVC pipe manufacturer.

D. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or another applicable method as recommended by manufacturer.

## 1.7 PRE-INSTALLATION MEETING

A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of thirty (30) days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

## 1.8 MOCK-UPS

A. 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.

## 1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials in compliance with manufacturer’s requirements to prevent their deterioration or damage due to moisture, temperature, contaminants, or other causes.

## 1.10 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.

### 1.11 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Nonsag Sealants:
1. Pecora Corporation: www.pecora.com/#sle.
2. QUIKRETE Companies: www.quikrete.com/#sle.
3. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
4. Sika Corporation: usa.sika.com/#sle.
5. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
6. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
7. Substitutions: See Section 016000 - Product Requirements for substitution procedures.

B. Self-Leveling Sealants:

### 2.2 JOINT SEALANT APPLICATIONS

A. Scope:
1. Interior Joints:
a. Do not seal gaps and openings in gypsum board and suspended ceilings
b. Seal the following joints:
1) Joints between door frames and adjacent construction.

### 2.3 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 61 16.

### 2.4 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.

B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Dow Corning Corporation; 795.
b. Pecora Corporation; Contractor Silicone.
c. Sika Corp; Sikasil WS-290.
d. Tremco Incorporated; Spectrem 3.

C. Urethane Joint Sealants
1. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
a. Products: Subject to compliance with requirements, provide one of the following:
1) Master Builders: MasterSeal NP-1.
2) Pecora Corporation; Dynatrol I-XL.
3) Sika Corp.: SikaFlex 201US.
4) Tremco Incorporated; Dymonic 100.

2. Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade P, Class 25, Uses T and NT.
    a. Products: Subject to compliance with requirements, provide one of the following:
        1) Master Builders: MasterSeal SL2.
        2) Pecora Corporation; Urexpan NR 200.
        3) Sika Corp.: SikaFlex – 2CSL
        4) Tremco Incorporated; Vulkem 445SSL.

### 2.5 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Dow Corning Corporation; 786-M White.
        b. Pecora Corp.: 898ST
        c. Sika Corp.: SikaSil N Plus US.
        d. Tremco Incorporated; Tremsil 200.

### 2.6 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) 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.

### 2.7 ACCESSORIES

A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.

B. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

C. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

D. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

### 3.2 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
    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. Porcelain enamel.
   c. Glazed surfaces of ceramic tile.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

## 3.3 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

## 3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

## 3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

## 3.6 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

### 3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces JS-#1.
   1. Joint Locations:
      a. Control and expansion joints in brick pavers.
      b. Isolation and contraction joints in cast-in-place concrete slabs.
      c. Joints between different materials listed above.
      d. Other joints as indicated on Drawings.
   2. Joint Sealant: Urethane, immersible, S, P, 25, T, NT, I.
   3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces JS-#2.
   1. Joint Locations:
      a. Construction joints in cast-in-place concrete.
      b. Joints between plant-precast architectural concrete units.
      c. Control and expansion joints in unit masonry.
      d. Joints in glass unit masonry assemblies.
      e. Joints in exterior insulation and finish systems.
      f. Joints between metal panels.
      g. Joints between different materials listed above.
      h. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
      i. Control and expansion joints in ceilings and other overhead surfaces.
   2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
   3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces JS-#3.
   1. Joint Locations:
      a. Isolation joints in cast-in-place concrete slabs.
      b. Control and expansion joints in exposed cast-in-place concrete slabs.
      c. Control and expansion joints in tile flooring.
      d. Control and expansion joints in resinous flooring.
      e. Insert type of joint sealant in "Joint Sealant" Subparagraph below; coordinate with Part 2. First option is example only
   2. Joint Sealant: Urethane, M, P, 25, T, NT.
   3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
      a. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces JS-#4, unless noted otherwise.
      b. Joint Locations:
      c. Control and expansion joints on exposed interior surfaces of exterior walls.
      d. The vertical joints in tile control and expansion joints.
      e. Vertical joints on exposed surfaces of unit masonry, concrete, walls, and partitions.
      f. Joints on underside of plant-precast structural concrete beams.
      g. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
      h. Corners of CMU construction.
      i. Countertops and walls.
      j. Note: Use JS-5 on vertical control joints and CMU corners up to 10’0” AFF.

4. Joint Sealant: Urethane, S, NS, 25, NT.
5. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

D. Joint Sealant Application: Security sealant for interior joints on vertical surfaces up to 10’-0” AFF JS#-5.
1. Joint Locations:
   a. Control and expansion joints and CMU corners on exposed interior surface of wall and partitions below 10-0: AFF; above 10’-0” use JS-4.
   b. Joint Sealant: Security sealant, pick-proof and tamper resistant sealant.
   c. Joint Sealant Color: As selected by architect from manufacturer’s full range of colors.

E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces JS-#6.
1. Joint Locations:
   a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
2. Joint Sealant: Silicone, mildew resistant, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors. Use clear at kitchen equipment.

**END OF SECTION**

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# SECTION 09 05 61 - COMMON WORK RESULTS FOR FLOORING PREPARATION

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specification and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES:

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile and sheet.
   2. Thin-set tile.

B. Preparation of existing concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

E. Remedial floor coatings.

### 1.3 REFERENCE STANDARDS

A. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).

B. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

### 1.4 DEFINITIONS

A. Refer to Section 01 42 16 - Definitions for the following terms:
   1. Adhesives.
   2. Leadership in Energy and Environmental Design (LEED).
   3. Volitile Organic Compound (VOC).

### 1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

### 1.6 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.7 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:

1. Moisture and alkalinity (pH) limits and test methods.
2. Manufacturer's required bond/compatibility test procedure.

D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
1. Manufacturer's qualification statement.
2. Manufacturer's statement of compatibility with types of flooring applied over remedial product.
3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
4. Manufacturer's installation instructions.
5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

E. Testing Agency's Report:
1. Description of areas tested; include floor plans and photographs if helpful.
2. Summary of conditions encountered.
3. Moisture and alkalinity (pH) test reports.
4. Copies of specified test methods.
5. Recommendations for remediation of unsatisfactory surfaces.
6. Product data for recommended remedial coating.
7. Include certification of accuracy by authorized official of testing agency.
8. Submit report directly to Owner.
9. Submit report to Architect.
10. Submit report not more than two business days after conclusion of testing.

F. Adhesive Bond and Compatibility Test Report.

G. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

## 1.8 PERFORMANCE REQUIREMENTS

A. Refer to the following for specific sub-flooring and finish flooring requirements:
1. Section 09 30 00 - Tilling
2. Section 09 65 00 - Resilient Flooring

## 1.9 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
2. Acceptable Testing Agencies:
a. Independent Floor Testing & Inspection, Inc. (IFTI): www.ifti.com/#sle.
b. Other testing agency approved by Owner.
c. Substitutions: Not permitted.

D. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.

E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

### 1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.

B. Deliver materials in manufacturer's packaging; include installation instructions.

C. Keep materials from freezing.

### 1.11 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F (18 degrees C) or more than 85 degrees F (30 degrees C).

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

### 1.12 WARRANTY

A. Provide Flooring Adhesive Manufacturer's:
   1. Delamination Warranty that there shall be no delamination failure:
      a. Due to adhesive failure for a period of five (5) years from date of installation when applied to adhere approved flooring materials per Adhesive manufacturer's requirements.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

A. Specifications are based on the products identified as Basis of Design. Manufacturers listed whose products meet or exceed the specifications are approved for use in the Work. Other manufacturers must have a minimum of five (5) years' experience manufacturing products meeting or exceeding the specifications and comply with Division 01 requirements regarding substitutions to be considered.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

### 2.2 MATERIALS

A. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

B. Remedial Floor Sheet Membrane: Pre-formed multi-ply sheet membrane installed over concrete subfloor and intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: 28 mil (0.028 inch) (0.711 mm).
   2. Tape: Types recommended by underlayment manufacturer to install membrane and cover seams.

## PART 3 EXECUTION

### 3.1 REMOVAL OF EXISTING FLOOR COVERINGS

A. Refer to Section 02 41 19 - Selective Demolition.

### 3.2 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering in accordance with Section 02 41 00 - Demolition.

2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
   a. Do not attempt to remove coating or penetrating material.
   b. Do not abrade surface.
3. Preliminary cleaning.
4. Moisture vapor emission tests; 3 tests in the first 1000 square feet (100 square meters) and one test in each additional 1000 square feet (100 square meters), unless otherwise indicated or required by flooring manufacturer.
5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
7. Specified remediation, if required.
8. Patching, smoothing, and leveling, as required.
9. Other preparation specified.
10. Adhesive bond and compatibility test.
11. Protection.

C. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

## 3.3 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

## 3.4 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet (1.4 kg per 93 square meters) per 24 hours.

F. Report: Report the information required by the test method.

## 3.5 PREPARATION

A. Refer to individual floor covering section(s) for additional requirements.

B. Comply with recommendations of testing agency.

C. Comply with requirements and recommendations of floor covering manufacturer.

D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

E. Do not fill expansion joints, isolation joints, or other moving joints.

### 3.6 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

### 3.7 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

### 3.8 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

**END OF SECTION**

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# SECTION 09 51 00 - ACOUSTICAL CEILINGS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

### 1.3 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023, with Editorial Revision (2024).

D. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

G. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

H. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2024a.

I. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests; 2023.

J. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

K. ASTM E1414/E1414M - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum; 2021a.

L. ITS (DIR) - Directory of Listed Products; Current Edition.

M. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

N. UL (FRD) - Fire Resistance Directory; Current Edition.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

### 1.6 SUBMITTALS

A. Refer Section 01 30 00.0 - Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.

D. Product Data: Provide data on suspension system components and acoustical units.

E. Samples: Submit two full size samples illustrating material and finish of acoustical units.

F. Samples: Submit two samples each, 12 inches (____ mm) long, of suspension system main runner, cross runner, and perimeter molding.

G. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

H. Manufacturer's qualification statement.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

### 1.7 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

### 1.8 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
   2. Certainteed Architectural: www.certainteed.com/ceilings-and-walls/#sle.
   3. Rockfon: www.rockfon.com/#sle.
   4. USG Corporation: www.usg.com/ceilings/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Suspension Systems:
   1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
   2. Certainteed Architectural: www.certainteed.com/ceilings-and-walls/#sle.
   3. Rockfon: www.rockfon.com/#sle.
   4. USG Corporation: www.usg.com/ceilings/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.2 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.

B. Acoustical Panels: Mineral fiber with vinyl-faced overlay, with the following characteristics:
   1. Application(s): Classrooms.
   2. Classification: ASTM E1264 Type A.
      a. Form: A2.2, wet formed.
   3. Size: 24 by 24 inches (610 by 610 mm).
   4. Thickness: 3/4 inch (19 mm).

5. Panel Edge: Tegular.
6. Color: White.
7. Suspension System Type Steel.: Exposed grid.
8. Products:
   a. Armstrong World Industries, Inc; Ultima High NRC #1941 (Basis of Design): www.armstrongceilings.com/#sle.
   b. Certainteed Architectural; Symphony m: www.certainteed.com/ceilings-and-walls/#sle.
   c. USG Corporation; Juno Acoustical Panels: www.usg.com/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Acoustical Panels: Mineral fiber with vinyl-faced overlay, with the following characteristics:
1. Application(s): Toilet Rooms.
2. Classification: ASTM E1264 Type A.
3. Size: 24 by 24 inches (610 by 610 mm).
4. Thickness: 3/4 inch (19 mm).
5. Panel Edge: Tegular.
6. Color: White.
7. Suspension System Type Steel.: Exposed grid.
8. Products:
   a. Armstrong World Industries, Inc; Ultima Helath Zone #1937 (Basis of Design): www.armstrongceilings.com/#sle.
   b. Certainteed Architectural; Symphony m: www.certainteed.com/ceilings-and-walls/#sle.
   c. USG Corporation; Juno Acoustical Panels: www.usg.com/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Acoustical Panels: Mineral fiber with vinyl-faced overlay, with the following characteristics:
1. Application(s): Corridors.
2. Classification: ASTM E1264 Type A.
   a. Form: A2.2, wet formed.
3. Size: 24 by 24 inches (610 by 610 mm).
4. Panel Edge: Tegular.
5. Color: White.
6. Suspension System Type Steel.: Exposed grid.
7. Products:
   a. Armstrong World Industries, Inc; Ultima FireGuard #1894 (Basis of Design): www.armstrongceilings.com/#sle.
   b. Certainteed Architectural; Symphony m: www.certainteed.com/ceilings-and-walls/#sle.
   c. USG Corporation; Juno Acoustical Panels: www.usg.com/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

E.

## 2.3 SUSPENSION SYSTEMS

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold-down clips, stabilizer bars, clips, and splices as required.
1. Materials:
   a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.

B. Exposed Suspension System: Hot-dip galvanized steel grid with steel cap.
1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
2. Profile: Tee; 15/16 inch (24 mm) face width.
3. Finish: Baked enamel.
4. Color: White.

5. Products:
    a. Armstrong World Industries, Inc; Prelude XL: www.armstrongceilings.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements for substitution procedures.

### 2.4 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch (2 mm) galvanized steel wire.

C. Intersection sleeve.

D. Perimeter Moldings: Same metal and finish as grid.
1. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
3. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

### 3.2 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

### 3.3 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions, as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
1. Install in bed of acoustical sealant.
2. Use longest practical lengths.
3. Overlap and rivet corners.

E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

### 3.4 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

### 3.5 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

### 3.6 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean surfaces.

C. Replace damaged or abraded components.

**END OF SECTION**

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# SECTION 09 65 00 - RESILIENT FLOORING

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included References are included

### 1.2 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

### 1.3 REFERENCE STANDARDS

A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers; 1998 (Reapproved 2023).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

D. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2023.

E. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2020.

F. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

G. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

D. Shop Drawings: Indicate seaming plans and floor patterns.

E. Verification Samples: Submit two samples, in size illustrating color and pattern for each resilient flooring product specified.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

### 1.6 ATTIC STOCK

A. Furnish the following for Owner's use in maintenance of project:
   1. Flooring Material: 12 boxers of each type, color, size and pattern.
   2. Extra Wall Base: 1 roll for each type, color size and pattern.

### 1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
   1. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.
   2. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

### 1.8 PRE-INSTALLATION MEETINGS

A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

B. The Contractor shall conduct a pre-installation Waxing meeting at the project site prior to starting finishing work; include PCS Maintenance Staff, and Plant Manager.

### 1.9 WARRANTY

A. Manufacturer’s Warranty covering manufacturing defects and installation integrity shall be indicated warranty period. Installation integrity is defined as products installed in accordance with the manufacturer’s installation manual.
   1. Warranty Period: Not less than five (5) years from Date of Substantial Completion.

B. Installer’s Warranty: Fully guarantee installation of tile and wall base against defects in installation, workmanship, and loss of adhesion for indicated warranty period.
   1. Warranty Period: Not less than one (1) year from Date of Substantial Completion.

### 1.10 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

D. Protect roll materials from damage by storing on end.

E. Do not double stack pallets.

### 1.11 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the architect in writing prior to bidding.
   1. Vinyl Tile Floor: Armstrong
   2. Resilient Base:
      a. Standard: Tarkett.

B. Products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product, and comply with Section 01 60 00 requirements regarding substitutions to be considered, including acceptance is provided by the Architect in writing prior to bidding.

### 2.2 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.
   1. Manufacturers:
      a. Armstrong Flooring; Excelon SDT: www.armstrongflooring.com/#sle.
      b. Tarkett Flooring: www.tarkett.com/#sle.
      c. Mannington.
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   4. Size: 12 by 12 inch (305 by 305 mm).
   5. Thickness: 0.125 inch (3.2 mm).
   6. Color: As selected by Architect from manufacturers full range..

### 2.3 RESILIENT BASE

A. Manufacturers:
   1. Flexco Corporation: www.flexcofloors.com/#sle.
   2. Mannington Commercial: www.manningtoncommercial.com#sle.
   3. Roppe Corporation: www.roppe.com/#sle.
   4. Tarkett Flooring; Baseworks: www.tarkett.com/#sle.
   5. Substitutions: See Section 016000 - Product Requirements for substitution procedures.

B. Height: 4 inches (100 mm).

C. Thickness: 0.125 inch (3.2 mm).
   1. Finish: Satin.
   2. Length: Roll.
   3. Color: As selected by Architect from manufacturers full range.

### 2.4 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Adhesives: As recommended by manufacturer.

C. Primers and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with Section 09 05 61.
   2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

### 3.2 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

### 3.3 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:
   1. Spread only enough adhesive to permit installation of materials before initial set.
   2. Fit joints and butt seams tightly.
   3. Set flooring in place, press with heavy roller to attain full adhesion.

D. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

### 3.4 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Install square tile to ashlar pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

### 3.5 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.

B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

### 3.6 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

### 3.7 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.
   1. CM is to provide Ramboard, Proflex, Cover Guard or equivalet protection board and be responsible for full protection of floor finishes until final complet.

**END OF SECTION**

# SECTION 09 91 23 - 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 SECTION INCLUDES

A. Surface preparation and the application of paint systems on the following interior substrates:
   1. Concrete.
   2. Concrete masonry units (CMU).
   3. Cementitious wood fiber.
   4. Steel.
   5. Galvanized metal.
   6. Wood.
   7. Gypsum board.
   8. Exposed sprayed fire-resistive materials.

B. Related Sections include the following:
   1. Section 099113"Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
   2. Section 099300 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.

### 1.3 DEFINITIONS

A. Gloss Level 1 (Flat): Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.

B. Gloss Level 2 (High Side, Flat): Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.

C. Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.

D. Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.

E. Gloss Level 5 (Semigloss): 35 to 70 units at 60 degrees, according to ASTM D523.

F. Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D523.

G. Gloss Level 7 (High Gloss): More than 85 units at 60 degrees, according to ASTM D523.

### 1.4 SUBMITTALS

A. Refer to Section 01 30 00 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: For each type of product indicated.

D. Paint Schedule: Provide a paint schedule indicating surface and actual paint product to be used on that surface for each surface and product.

E. Samples for Initial Selection: For each type of topcoat product indicated.

F. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.
   1. Submit Samples on rigid backing, 8 inches (203.2 mm) square.
   2. Step coats on Samples to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

### 1.5 INFORMATION SUBMITTALS

A. Qualification Data: For applicator.

### 1.6 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

### 1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

### 1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

C. This Project contains existing surfaces requiring additional preparation from new/unpainted surfaces. Prepare existing surfaces in accordance with “Preparation of Existing Surfaces” specified elsewhere in this section.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
   1. Benjamin Moore & Co. (Moore).
   2. Pittsburgh Paints (PITT) – formerly PPG Paint
   3. Sherwin Williams (S/W)

### 2.2 PAINT, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors: As selected by Architect from manufacturer's full range.

D. Accent Painting: Accent painting is defined as painting of indicated surfaces with a different color than adjacent surfaces. Contractor shall assume the following surfaces will receive accent painting:
   1. All metal door and view window frames.
   2. All metal window frames in wood doors.

## 2.3 BLOCK FILLERS

A. Concrete Unit Masonry Block Filler: Factory-formulated acrylic latex block fillers. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 8 mils (0.2032 mm).
   1. Basis-of-Design: S/W B25W25 Prep Rite Acrylic Latex Block Filler
   2. Moore 571 Ultra Spec Hi-Build Masonry Block Filler
   3. PITT 6-7 Speedhide Acrylic Latex Masonry Block Filler

## 2.4 INTERIOR PRIMERS

A. Interior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic-latex interior primer for interior application. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 1.2 mils (0.03048 mm).
   1. Basis-of-Design: S/W LX02W0050 Loxon Concrete and Masonry Latex Primer
   2. Moore 608 Ultra Spec Masonry Interior/Exterior 100% Acrylic Sealer
   3. PITT 4-603XI Perma Crete Alkali Resistant Primer

B. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 1.2 mils (0.03048 mm).
   1. Basis-of Design: S/W B28W2600 Pro Mar 200 Zero VOC Latex Primer
   2. Moore N534 Ultra Spec 500 Interior Latex Primer
   3. PITT 6-2 Speedhide Latex Primer Sealer

C. Interior Wood Primer for Full-Gloss Alkyd-Enamel Finishes: Factory-formulated alkyd- or acrylic-latex-based interior wood primer. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 1.5 mils (0.0381 mm).
   1. Basis-of-Design: S/W B49W8820 Multi-Purpose Oil Based Primer
   2. Moore 032 Fresh Start Undercoater and Primer/Sealer
   3. PITT 17-921X 1 Seal Grip Universal Primer

D. Interior Ferrous-Metal Primer (unless noted otherwise): Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 2.0 mils (0.0508 mm).
   1. Basis-of-Design: S/W B50*Z6 Kem Kromik Universal Metal Primer
   2. Moore HP04 Ultra Spec HP Acrylic Metal Primer
   3. PITT Multiprime 4160 Rust Inhibitive Alkyd Primer

E. Interior Ferrous-Metal Primer for Dryfog/Dryfall Finishes: Factory-formulated quick-drying rust-inhibitive acrylic metal primer. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 2.0 mils (0.0508 mm).
   1. Basis-of-Design: S/W B66 Pro Industrial Pro-Cryl Universal Prime
   2. Moore HP04 Ultra Spec HP Acrylic Metal Primer
   3. PITT 90-1912 Pitt-Tech Plus EP Hi Performance Acrylic Primer & Finish

F. Interior Epoxy-Metal Primer for Ferrous Metal Receiving Acrylic Aliphatic Coatings: Factory-formulated epoxy metal primer. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 2.0 mils (0.0508 mm).
   1. Basis-of-Design: S/W B67 Series Recoatable Epoxy Primer
   2. Moore V150 Corotech Polyamide Epoxy Primer
   3. PITT PPG Amerlock 2 High Solids Epoxy

G. Interior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 2.0 mils (0.0508 mm).
   1. Basis-of-Design: S/W B66-1310 Pro Industrial Pro-Cryl Universal Primer
   2. Moore HP04 Ultra Spec Acrylic Metal Primer

3. PITT 90-1912 Pitt-Tech Hi Plus EP Performance Acrylic Primer

H. Interior Zinc-Coated Metal Primer for Dryfall/Dryfog Finishes: Factory-formulated rust-inhibitive acrylic metal primer. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 2.0 mils (0.0508 mm).
1. Basis-of-Design: S/W B66 Pro Industrial Pro-Cryl Universal Primer
2. Moore HP04 Ultra Spec Acrylic Metal Primer
3. PITT 90-1912 Pitt-Tech Plus EP Hi Performance Acrylic Primer

**2.5 INTERIOR FINISH COATS**

A. Interior Low-Luster Acrylic Enamel: Factory-formulated eggshell acrylic-latex interior enamel. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 2.8 mils (0.07112 mm), excluding primer coat.
1. Basis-of-Design: S/W B20W12651 ProMar 200 Zero VOC Latex Eggshell
2. Moore T538 Ultra Spec 500 Interior Eggshell
3. PITT 6-411ZV Series Speedhide Zero VOC Latex Eggshell

B. Interior Flat Waterborne Acrylic Dryfall (Dryfog): Factory-formulated flat waterborne acrylic-dryfall (dryfog) for interior application. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 1.5 mils per coat.
1. Moore 395 Latex Dry Fall Flat
2. PITT 6-725XI Speedhide Super Tech WB Acrylic Flat Dryfog
3. S/W B42W181 Pro Industrial Waterborne Acrylic Dryfall Flat

C. Interior Waterborne DTM Acrylic Enamel: Factory formulated gloss waterborne DTM acrylic enamel. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 1.0 mil(s), excluding primer coat.
1. Moore HP28 Ultra Spec HP D.T.M. Acrylic Gloss Enamel
2. PITT 90-1310 Pitt-Tech Plus Waterborne Acrylic Gloss Industrial Enamel
3. S/W B66-1051 Pro Industrial DTM Acrylic Coating, Gloss

D. Interior Semigloss Waterborne Acrylic Dryfall/Dryfog: Factory-formulated semigloss waterborne acrylic dryfall/dryfog for interior application. Apply at a spreading rate recommended by the manufacturer but not less than a dry film thickness of 2.0 mils (0.0508 mm), per coat.
1. Basis-of-Design: S/W B42W83 Low VOC Waterborne Acrylic Dryfall Semi-Gloss
2. Moore 399 Latex Dry Fall Semi-Gloss
3. PITT 6-724XI Speedhide Super-Tech WB Semi-Gloss Dryfog

E. Interior Full-Gloss Acrylic Aliphatic Urethane: Factory-formulated full-gloss acrylic aliphatic urethane. Apply at a spreading rate recommended by the manufacturer but not less than a total dry film thickness of 4.0 mils (0.1016 mm) excluding primer coat.
1. Basis-of-Design: S/W B65-300 High Solids Polyurethane
2. Moore V500 Corotech Aliphatic Acrylic Urethane Gloss
3. PITT 95-812 Series Pitt-Thane Ultra Acrylic Aliphatic Gloss Urethane

F. Interior Full-Gloss Alkyd Enamel for Wood and Metal Surfaces: Factory-formulated full-gloss alkyd interior enamel. Apply at a rate recommended by the manufacturer but not less than a total dry film thickness of 2.0 mils (0.0508 mm) per coat.
1. Basis-of-Design: S/W B54-150 Series Pro Industrial Urethane Alkyd Enamel, Gloss
2. Moore P22 Super Spec HP Urethane Alkyd Gloss Enamel
3. PITT 4139-10 Glyptex Alkyd Gloss Enamel

**PART 3 EXECUTION**

**3.1 EXAMINATION**

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Concrete: 12 percent.
   2. Masonry (Clay and CMU): 12 percent.
   3. Wood: 15 percent.
   4. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
   1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

E. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

**3.2 PREPARATION**

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
   2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. 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. Concrete Masonry Substrates: Remove 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.

F. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

H. Wood Substrates:
   1. Scrape and clean knots and apply coat of knot sealer before applying primer.
   2. Sand surfaces that will be exposed to view, and dust off.
   3. Prime edges, ends, faces, undersides, and backsides of wood.
   4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

I. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

**3.3 PREPARATION OF EXISTING SURFACES:**

A. General: All surfaces must be cleaned and be free of mildew and construction dust and dirt. Remove all gum and tape and subsequent residue. Repair cracks and remove old, deteriorated caulk in masonry walls. Bare wood and metal must be spot primed. All loose paint must be scraped and/or sanded to provide sound substrate. Rusty metal must be wire brushed and scraped to remove any loose paint.

B. Priming and Blockfill on Existing Surfaces: Unless required by manufacturer, specified primers and block fillers may be omitted on existing surfaces where existing finishes are in good condition and are not otherwise removed. Any areas of peeling paint removal or removal of any existing finishes down to bare substrates and shall be re-primed or blockfilled prior to installing new paint finishes. If existing surfaces require priming, new primers shall be as recommended by the paint manufacturer for the existing surfaces/conditions present.

C. Existing CMU Walls: Before painting existing block, clean walls of airborne grease and residue, hand oils and any other substance that would prevent adhesion of the finish coat and scuff sand all glossy surfaces. Remove all peeling paint. Repair any damaged areas and sand areas where paint has chipped to reduce the cratered edges. Since some areas require the addition of new CMU next to existing CMU, a similar system must be followed to obtain the same finished look. New CMU should be block filled so that it resembles the same texture as adjoining blocks.
   1. In no case is paint to be applied over existing non-adhering substrate.

D. All Existing Metal Door and Window Frames: Using a grease cutting detergent, clean all surfaces to be painted. Sand with a fine grit sandpaper, wipe off dust, and apply a metal primer to any bare metal surfaces.

**3.4 APPLICATION**

A. Apply paints according to manufacturer's written instructions.
   1. Use applicators and techniques suited for paint and substrate indicated.
   2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
   1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
   1. Prefinished items include the following factory-finished components:
      a. Architectural woodwork.
      b. Acoustical wall panels.
      c. Manufactured toilet enclosures.
      d. Metal lockers.
      e. Unit kitchens.
      f. Elevator entrance doors and frames.
      g. Elevator equipment.

h. Finished mechanical and electrical equipment.
i. Light fixtures.
j. Prefinished wood doors.
k. Prefinished acoustical metal deck.
l. Prefinished aluminum storefront.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
   a. Foundation spaces.
   b. Furred areas.
   c. Ceiling plenums.
   d. Utility tunnels.
   e. Pipe spaces.
   f. Duct shafts.
   g. Elevator shafts.
3. Finished metal surfaces include the following:
   a. Anodized aluminum.
   b. Stainless steel.
   c. Chromium plate.
   d. Copper and copper alloys.
   e. Bronze and brass.
4. Operating parts include moving parts of operating equipment and the following:
   a. Valve and damper operators.
   b. Linkages.
   c. Sensing devices.
   d. Motor and fan shafts.
   e. Door hardware
5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

E. 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.

F. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:
1. Mechanical Work:
   a. Uninsulated metal piping.
   b. Uninsulated plastic piping.
   c. Pipe hangers and supports.
   d. Tanks that do not have factory-applied final finishes.
   e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
   f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
   g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
2. Electrical Work:
   a. Switchgear.
   b. Panelboards.
   c. Electrical equipment that is indicated to have a factory-primed finish for field painting.

## 3.5 FIELD QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
   1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
   2. Testing agency will perform tests for compliance with product requirements.
   3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

## 3.6 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

## 3.7 INTERIOR PAINTING SCHEDULE

A. Concrete and Masonry (Other Than Concrete Unit Masonry): Provide the following paint systems over interior concrete and brick masonry substrates:
   1. Interior Waterborne DTM Acrylic Gloss Finish: Two finish coats over a primer.
      a. Primer: Interior concrete and masonry primer.
      b. Finish Coats: Interior waterborne DTM acrylic gloss enamel.

B. Concrete Unit Masonry: Provide the following finish systems over interior concrete masonry:
   1. Interior Waterborne DTM Acrylic Gloss Finish: Two finish coats over a block filler or primer.
      a. Block Filler: At new CMU, provide concrete unit masonry block filler.
      b. Primer: At existing CMU, provide primer recommended by manufacturer based on existing conditions.
      c. Finish Coat: Interior waterborne DTM acrylic gloss enamel.

C. Cementitious Wood-Fiber Deck and Exposed Spray Fire-Resistive Materials: Provide the following finish systems over interior mineral-fiber-reinforced cement panels and exposed spray fire-resistive materials on beams and joists:
   1. Low-Luster Acrylic-Enamel Finish: Two finish coats. No primer required on panels but prime metal bulb tees as specified for interior ferrous metals finishes.
      a. Finish Coats: Interior low-luster acrylic enamel.

D. Gypsum Board Unless Noted Otherwise: Provide the following finish systems over interior gypsum board surfaces:
   1. Low-Luster Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior gypsum board primer.
      b. Finish Coats: Interior low-luster acrylic enamel.

E. Gypsum Board in Wet Areas: Provide the following finish system over interior gypsum board surfaces:

1. Low VOC Waterborne Polyamide Epoxy Gloss Finish: Two finish coats over an interior gypsum board primer.
    a. Primer: Interior Gypsum board primer.
    b. Finish Coats: Interior low VOC, polyamide gloss epoxy.

F. Exposed Sprayed Fire-Resistive Materials: Provide the following finish systems over new interior plaster surfaces and exposed sprayed fire-resistive materials on columns:
1. Low-Luster Acrylic-Enamel Finish: Two finish coats over a primer.
    a. Primer: Interior plaster primer.
    b. Finish Coats: Interior low-luster acrylic enamel.

G. Wood and Hardboard: Provide the following paint finish systems over new interior wood surfaces:
1. Full-Gloss Alkyd-Enamel Finish: Two finish coats over a wood primer.
    a. Primer: Interior wood primer for full-gloss alkyd-enamel finishes.
    b. Finish Coats: Interior full-gloss alkyd enamel for wood and metal surfaces.

H. Ferrous Metal: Provide the following finish systems over ferrous metal, unless indicated otherwise:
1. Full-Gloss Alkyd-Enamel Finish: Two finish coats over a primer.
    a. Primer: Interior ferrous-metal primer.
    b. Finish Coats: Interior full-gloss alkyd enamel for wood and metal surfaces.

I. Ferrous Metal: Provide the following finish systems over ferrous metal roof deck and exposed bar joists:
1. Semi-Gloss Waterborne Acrylic Dryfall (Dryfog) Finish: One finish coat over a primer.
    a. Primer: Interior ferrous-metal primer for dryfog/dryfall finishes.
    b. Finish Coats: Interior semigloss waterborne acrylic dryfall/dryfog.

J. Ferrous Metal: Provide the following finish systems over ferrous metal handrails and guard rails:
1. Full-Gloss Acrylic Aliphatic Urethane Finish: Two finish coats over a primer.
    a. Primer: Interior epoxy metal primer.
    b. Finish Coats: Interior full-gloss acrylic aliphatic urethane coating.

K. Zinc-Coated Metal: Provide the following finish systems over interior zinc-coated metal surfaces:
1. Full-Gloss Alkyd-Enamel Finish: Two finish coats over a primer.
    a. Primer: Interior zinc-coated metal primer.
    b. Finish Coats: Interior full-gloss alkyd enamel for wood and metal surfaces.

L. Zinc-Coated Metal: Provide the following finish systems over interior zinc-coated (galvanized) roof deck.
1. Semi-Gloss Waterborne Acrylic Dryfall (Dryfog) Finish: One finish coat over a primer.
    a. Primer: Interior zinc-coated metal primer for dryfall/dryfog finishes.
    b. Finish Coats: Interior semi-gloss waterborne acrylic dryfall (dryfog).

**END OF SECTION**

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# SECTION 09 93 00 - STAINING AND TRANSPARENT FINISHING

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Sanding and preparing existing door doors for refinishing.

B. Field application of stains.

C. Field application of transparent finishes.

### 1.3 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

### 1.4 REFERENCE STANDARDS

A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.

B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).

C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

E. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

### 1.5 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.6 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal requirements.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and catalog number, and general product category.
   2. Manufacturer's installation instructions.

D. Samples: Two samples on actual wood substrate to be finished, 6 by 6 inches in size, indicating selected colors and sheens for each system, with specified coats cascaded.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Manufacturer's Qualification Statement.

G. Applicator's Qualification Statement.

H. Maintenance Data: Submit data including finish schedule showing where each product, color, and finish was used, product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements for additional provisions.

2. Extra Stock Materials: Stain and transparent finish materials, 1 gal (4 L) of each color and type; store where directed.
    a. Label each container with color and type in addition to the manufacturer's label.

### 1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with at least three years of documented experience.

B. Applicator Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

### 1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of stain or transparent finish, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Stain and Transparent Finish Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

### 1.9 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by manufacturer of stains and transparent finishes.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F (3 degrees C) above the dew point, or to damp or wet surfaces.

D. Minimum Application Temperature: 50 degrees F (10 degrees C) unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 fc (860 lux) measured mid-height at substrate surface.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Provide finishes from the same manufacturer to the greatest extent possible.
    1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.

B. Transparent Finishes:
    1. BEHR Process Corporation: www.behr.com/#sle.
    2. Pittsburgh Paints: www.pittsburghpaints.com/#sle.
    3. (Basis of Design) Sherwin-Williams Company: www.sherwin-williams.com/#sle.
    4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Stains:
    1. BEHR Process Corporation: www.behr.com/#sle.
    2. Bona US: www.bona.com/#sle.
    3. Nova USA Wood Products: www.novausawood.com/#sle.
    4. Pittsburgh Paints: www.pittsburghpaints.com/#sle.
    5. (Basis of Design) Sherwin-Williams Company: www.sherwin-williams.com/#sle.
    6. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.2 STAINS AND TRANSPARENT FINISHES - GENERAL

A. Finishes:

1. Provide finishes capable of being readily and uniformly dispersed to homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Provide materials compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
3. Supply each finish material in quantity required to complete entire project's work from a single production run.
4. Do not reduce, thin, or dilute finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Flammability: Comply with applicable code for surface burning characteristics.

C. Sheen to match existing woodwork.

D. Colors: To match existing woodwork..

### 2.3 INTERIOR STAIN AND TRANSPARENT FINISH SYSTEMS

A. Finish on Wood - Vertical Surfaces:
1. one-coat stain.
2. two-coat varnish.
3. Stain: Semi-transparent stain for wood, solvent based.
4. Top Coat: Polyurethane varnish, high build.
   a. Products:
      1) Sherwin-Williams MinWax High Build Polyurethane, Satin.
      2) Substitutions: See Section 01 25 00 - Substitution Procedures.
5. Top Coat Sheen:
   a. To match existing woodwork (doors).

### 2.4 ACCESSORY MATERIALS

A. Accessory Materials: Cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of finished surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Wood: 15 percent, measured in accordance with ASTM D4442.

### 3.2 PREPARATION

A. Sand and clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing finishes that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried;

sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

### 3.3 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

D. Sand wood surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

G. Reinstall items removed prior to finishing.

### 3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for general requirements for field inspection.

### 3.5 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

### 3.6 PROTECTION

A. Protect finishes until completion of project.

**END OF SECTION**

# SECTION 10 21 13.19 - PLASTIC TOILET COMPARTMENTS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Solid plastic toilet compartments and urinal screens.

### 1.3 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

D. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Provide data on panel construction, hardware, and accessories.

D. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall and floor supports, door swings.

E. Samples: Submit two samples of partition panels, in size illustrating panel finish, color, and sheen.

F. Manufacturer's Instructions: Indicate special procedures and perimeter conditions requiring special attention.

### 1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.

### 1.7 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

A. Deliver, store, and handle materials and products in accordance with manufacturer's instructions and recommendations and industry standards.

A. Lay cartons flat; support to ensure flatness and prevent damage to prefinished surfaces.

### 1.8 FIELD CONDITIONS

A. Ambient Conditions: Maintain environmental conditions, such as temperature, humidity, and ventilation, within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

### 1.9 WARRANTY

A. Manufacturer Warranty: Provide 10-year manufacturer warranty for material against breakage, corrosion, and delamination. Complete forms in Owner's name and register with manufacturer.

**1.10 ATTIC STOCK:**

A. Furnih the following materials at substantial completiion:
   1. Door HInges: 4 hinges with fasteners.
   2. Latch and Keeper: 4 latches and keepers with fasteners.
   3. Door Bumpers: 10 bumpers with fasteners.
   4. Door Pulls: 4 door pulls s with fasteners.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the architect in writing prior to bidding.
   1. Scranton Products; Hiny Hiders Partitions: www.scrantonproducts.com/#sle.

B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
   1. ASI Accurate Partitions: www.asi-accuratepartitions.com/#sle.
   2. Bradley Corporation; Bradmar Partitions
   3. Hadrian; Hadrian - Standard Series - Plastic: www.hadrian-inc.com/#sle.
   4. Substitutions: Section 01 60 00 - Product Requirements.

**2.2 DESIGN CRITERIA**

A. Accessibility: Comply with ICC A117.1 and ADA Standards.

A. Surface Burning Characteristics: Flame spread index of 26 to 75 and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

**2.3 SOLID PLASTIC TOILET COMPARTMENTS**

A. General Description: Factory-fabricated doors, pilasters, and divider panels made of solid, molded, high-density polyethylene (HDPE); floor-mounted, headrail-braced.

A. Color: As selected by Architect.

A. Doors:
   1. Thickness: 1 inch (25 mm).
   1. Width: 24 inches (610 mm).
   1. Width for Handicapped Use: 36 inches (915 mm), outswinging.
   1. Height: 55 inches (1397 mm).

A. Panels:
   1. Thickness: 1 inch (25 mm).
   1. Height: 55 inches (1397 mm).
   1. Depth: As indicated on drawings.

A. Pilasters:
   1. Thickness: 1 inch (25 mm).
   1. Width: As required to fit space; minimum 3 inches (76 mm).

A. Urinal Screens: Without doors; to match compartments; mounted to wall with continuous panel brackets.

**2.4 FABRICATION**

A. Fabricate toilet compartment components to sizes indicated in shop drawings.

A. Coordinate requirements and provide cutouts for through-partition toilet accessories.

A. Provide shoes and caps at pilasters and posts to conceal anchorage, supports, and leveling mechanisms.

A. Provide manufacturer's standard corrosion-resistant supports, leveling mechanisms, anchors, and anchoring assemblies for pilasters and posts.

A. Floor-Anchored, Overhead-Braced Units: Provide supports, leveling mechanisms, and anchors at pilasters to suit floor conditions.

### 2.5 MATERIALS

A. Aluminum Castings: ASTM B26/B26M.

A. Aluminum Extrusions: ASTM B221 (ASTM B221M).

A. High-Density Polyethylene (HDPE):
1. Composition: Formed from waterproof, nonabsorbent, HDPE resins.
1. Properties: Mark-resistant, self-lubricating surface.
1. Material Fire Ratings: ICC (IBC), Class B.

A. Stainless Steel Sheet, Plate, and Bar: ASTM A240/A240M or ASTM A666/A666M, Type 304, stretcher-leveled standard of flatness.

A. Stainless Steel Castings: ASTM A743/A743M.

### 2.6 ACCESSORIES

A. Pilaster Shoes: Stainless steel, satin finish, 3 inches (76 mm) high; concealing floor fastenings.
1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Headrails: Extruded aluminum, anti-grip profile.
1. Size: Manufacturer's standard size.

C. Wall and Pilaster Brackets: Stainless steel; manufacturer's standard type for conditions indicated on drawings.

D. Attachments, Screws, and Bolts: Stainless steel, tamper-proof type.

E. Hinges: Stainless steel, manufacturer's standard finish.
1. Pivot hinges, gravity type, adjustable for door-close positioning; two per door.

F. Door Hardware: Stainless steel, manufacturer's standard finish.
1. Door Latch: Slide type with exterior emergency access feature.
2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.
3. Provide door pull for outswinging doors.

G. Coat Hook: One per compartment, mounted on door.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify dimensions, tolerances, and interfaces with other work.

B. Verify spacing of and between plumbing fixtures.

### 3.2 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's written instructions.

B. Maintain 3/8-to-1/2-inch (10 to 12 mm) space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate headrail joints at pilaster center lines.

E. Replace damaged or scratched materials with new materials. Do not touch up scratches or damaged finish in field.

### 3.3 TOLERANCES

A. Maximum Variation from True Position: 1/4 inch (6 mm).

B. Maximum Variation from Plumb: 1/8 inch (3 mm).

### 3.4 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).

B. Adjust hinges to position doors in partially open position when unlatched. Return outswinging doors to closed position.

**END OF SECTION**

# SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 01 General Requirements and References, are included as a part of this Section as though bound herein..

### 1.2 SECTION INCLUDES

A. Accessories including but not limited to:
   1. Toilet accessories.
   2. Accessories necessary for a complete installation.

### 1.3 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2024.

E. ASTM F446 - Standard Consumer Safety Specification for Grab Bars and Accessories Installed in the Bathing Area; 2019 (Reapproved 2023).

F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

G. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).

H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2025, with Errata (2026).

I. AWS D1.6/D1.6M - Structural Welding Code— Stainless Steel; Current.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 SUBMITTALS

A. Refer to Section 01 30 00.0 – Administrative Requirements for submittal procedures.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

C. Product Data: Technical Data including construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   1. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   2. Include electrical characteristics.

D. Samples: Provide a sample to demonstrate each exposed product finish specified.

E. Product Schedule: Show types, quantities, sizes, and installation locations by room of each accessory required. Identify locations using room designations indicated.

F. Maintenance Data: Submit for inclusion in maintenance manuals.

### 1.6 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Accessibility Requirements: Comply with applicable requirements.

a. U.S. Architectural and Transportation Barriers Compliance Board Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).
b. ICC/ANSI A117.1 Accessible and Useable Building and Facilities.

B. Source Limitations: Obtain products from single source from single manufacturer.

## 1.7 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

# PART 2 PRODUCTS

## 2.1 MANUFACTURERS

A. Manufacturers.
1. American Specialties, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.

B. Refer to Section 01 60 00 – Product Requirements for substitution procedures.

## 2.2 DESCRIPTION

A. Regulatory Requirements:
1. Code Standards:
a. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.
2. Welding Qualifications: Qualify procedures and personnel according to the following:
a. Aluminum: AWS D1.2/D1.2M.
b. Sheet Steel: AWS D1.3/D1.3M.
c. Stainless Steel: AWS D1.6/D1.6M.
d. Steel: AWS D1.1/D1.1M.

## 2.3 MATERIALS

A. Stainless Steel: ASTM A666/A666M, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

B. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.

C. Galvanized Steel Sheet: ASTM A653/A653M, with G60 (Z180) hot dip zinc coating.

D. Galvanized Steel Mounting Devices: ASTM A153/A153M, hot dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

## 2.4 COMPONENTS

A. Underlavatory Guard: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
1. Material and Finish: Antimicrobial, molded plastic, white.

## 2.5 FABRICATION

A. Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

## PART 3 EXECUTION

### 3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F446.

### 3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items. Remove temporary labels and protective coatings. Clean and polish exposed surfaces according to manufacturer's written recommendations.

## PART 4 SCHEDULE

### 4.1 TOILET ACCESSORY SCHEDULE

A. TA5 - Grab Bars: (At Wheelchair-Accessible Water Closets):
   1. Basis of Design Product:
      a. Model B-6806 manufactured by Bobrick.
   2. Size/Finish: 1-1/2 inch (38 mm) 1-1/2 inch diameter satin stainless steel.
   3. Mounting: Attach with concealed mounting kit. Mount parallel to floor.
   4. Location: At each wheelchair-accessible water closet.
   5. Sizes: As indicated on Drawings.

**END OF SECTION**

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SECTION 22 00 01 – PLUMBING
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SECTION 22 00 01 – PLUMBING

CONTRACTOR QUALIFICATIONS:

All Plumbing Contractors shall meet the following minimum criteria. This criteria shall be part of the contract bid documents.

1. Contractors shall have been in business a minimum of five (5) years from the duration of the project consecutively under their current name and current registration with the SC Secretary of State.

2. Contractors shall have experience in the construction of similar projects. A list of at least five (5) completed projects of similar scope and size, which shall be submitted before issuance of a purchase order.

3. Contractors shall be individually bondable in the state of South Carolina by a surety in accordance with AIA-201.

4. Contractors, its principal operators, license holders, or corporate shareholders shall not have been involved in bankruptcy proceedings in the contracting business within the last ten (10) years or be involved in pending actions concerning bankruptcy in the contracting business.

GENERAL PROVISIONS:
The Instructions to Bidders, General Requirements, General Conditions of the Contract and the Supplementary General Conditions shall form a part of the specifications for this work insofar as they apply to these Plumbing Specifications.

A. The scope of work to be provided under these specifications includes the furnishing, delivering, unloading, handling, erection, adjusting, and testing of all materials, equipment and apparatus which are required for the completion and correct operation in all respects of the plumbing system as indicated on the drawings and specified herein.

B. Certified vendor shop drawings shall be utilized for dimensions, connections, etc. of all equipment. Contractor shall refer to architectural drawings for exact building dimensions, construction details, etc.

C. The Contractor shall be responsible for coordination with all disciplines at the job site to insure proper installation of the system with no interferences and with proper clearance. The progress of the work shall conform with and not delay the work of other trades. The entire installation shall be completed as soon as the condition of the building will permit.

D. All equipment shall be installed in strict accordance with manufacturer's recommendations and instructions. These instructions shall be considered as a part of these specifications.

E. Full opportunity shall be given to the Architect/Engineer to make any inspections as desired, of all phases of construction and equipment. Any work which is being improperly installed may be rejected as specified in the General Conditions.

F. All plumbing equipment and materials delivered and accepted for subject job, shall become the responsibility of the contractor. He shall be liable in the event of theft, loss, destruction, etc. All materials shall be properly protected from weather, moisture, or damage in any way.

G. Pipe routing shall conform as close as possible to locations as indicated on the contract drawings. Additional offsets, fittings, etc., required due to conflicts with trades and /or to meet field conditions shall be furnished and installed as necessary.

H. All bidders shall visit the job site and familiarize themselves with existing job conditions, as no extra cost will be allowed because of additional work necessitated or changes in plans required by job conditions, unless same is brought to the attention of the Architect prior to receipt of bids.

I. Quality of the Work:
With the installation of all aboveground piping and all accessories, the fit and finish shall be in accordance with a high standard of skilled craftsmanship, and with established standards of the traders and shall be neatly mounted square and plumb to the building surfaces and structures.

J. Unless indicated otherwise on the plans, all above ground piping and accessories shall be installed concealed in the walls or above ceilings. Any wall mounted piping and accessories indicated to be exposed shall have an approved sheet metal cover, painted to match the adjacent surfaces.

K. At any connections to existing piping systems, contractor shall verify invert and location of connections prior to routing any pipe.

SHOP DRAWINGS:
After award of the contract, the successful contractor shall submit shop drawings of all items of equipment. They shall be submitted as noted under the General Requirements section of these specifications. Except under special permission, orders shall not be placed until shop drawings have been reviewed by the Engineer. Shop drawings shall be project specific; generic submittals shall not be accepted.

An electronic PDF will be acceptable, but must also have at least one paper copy submitted to the engineer. Electronic copy alone is unacceptable. Paper copy must be prepared and printed by the submitting vendor.

Where required by local code officials, provide manufacturer's equipment installation literature.

RECORD DRAWINGS:
Mark any changes in pipe routing, equipment, or deviations from Contract Drawings on clean set of prints; deliver to Architect for transmittal to Owner at completion of contract.

SUBSTITUTE EQUIPMENT:
A. In the event the Contractor substitutes any equipment or materials in lieu of that indicated on the drawings and specified: any change in service connections (electrical, structural, piping, controls, drains, fire protection, etc.) or any related items, shall require the Contractor to make all necessary coordination changes. The Contractor shall insure that the changes do not alter the system functions as intended with original equipment.

B. The substitute manufacturers listed in these specifications shall be acceptable substitutes if they meet the specifications in all respects.

C. All materials and equipment shall be new and shall conform to the grade, quality, and standards of those specified.

D. Design of the system is based on installation of specified materials and equipment. Other materials and equipment may be used if approval is secured from the Engineer prior to bidding. Approvals granted will be issued by addenda to specifications. Such requests for consideration must be made ten (10) days prior to bid date.

ACCEPTANCE AND COMPLETION:
A. Upon completion of the job, the contractor shall furnish to the owner, in a ring binder, three complete sets of all equipment instructions, including: guarantees, operation, maintenance, and installation data. Contractor shall also provide the information listed above in electronic PDF format, on a portable flash drive.

B. The job shall not be considered complete until all systems have been shown to the satisfaction of the Architect/Engineer to function properly and consistently.

C. All equipment and material shall be thoroughly cleaned and spot painted as required.

GUARANTEE:
The Contractor shall guarantee the entire system for one full year from date of substantial completion. This guarantee shall include all materials and labor as required to correct any deficiencies or maintain any equipment. The cost of said guarantee shall be a part of the original contract bid and shall not bear any extra expense to the Owner. Any adjustments or corrections made within the year of guarantee shall be equal to the quality of materials and workmanship originally called for and shall be subject to inspection and acceptance by the Architect/Engineer.

ELECTRICAL:
Power wiring to all motors, water heaters, and electric water coolers shall be provided by other divisions. Starters shall be furnished by the Plumbing Contractor (see electrical drawings for power service required); all control wiring by Plumbing Contractor.

STERILIZATION:
The completed water system shall be sterilized by filling the entire system beginning at the meter connection with a solution of 50 PPM Chlorine, allowing the solution to flow through the system until a residual is established at all water taps. Allow the solution to remain in the system a minimum of twenty-four (24) hours. Completely flush the system with city water prior to placing in operation. Final approval shall not be issued until a water sample is analyzed and approved by a South Carolina Dept. of Health and Environmental Control certified laboratory. Lab fees shall be paid for by the Plumbing Contractor.

PERMITS AND FEES:
The Contractor shall obtain and pay for all permits required, give all legal notices and pay all fees for utility connections, for inspections, for back flow protection certification or as otherwise required for the work.

PHASING:
Refer to construction phase schedule requirement in section 1010 for schedule of the work.

CODE:
The entire Plumbing System shall be installed in accordance with the standards prescribed by the International (and SC) Plumbing Code, International (and SC) Fuel Gas Code, and other applicable local codes. System shall comply with all requirements of the S.C. Department of Public Health. Where specified materials and methods exceed minimum Code requirements, the drawings and specifications shall supersede the Code.

DEMOLITION:
Unless noted otherwise on the plans, all materials and equipment removed shall become the property of the Contractor and shall be disposed of by the Contractor.

Any materials and equipment which the Owner wishes to salvage shall be removed by the Owner prior to the start of the Contractor’s work. Coordinate with Owner.

Refer to the drawings for the extent of demolition.

ASBESTOS REMOVAL:
Asbestos removal shall be by the Owner. If the Contractor suspects an area contains asbestos, the Owner/Architect should be contacted immediately.

SEISMIC RESTRAINTS:

1. Equipment and piping shall be restrained to resist seismic forces. Restraints shall maintain equipment and piping in a captive position. Restraint devices shall be designed and selected to meet the seismic requirements as defined in the latest edition of the IBC (International Building Code).

   All restraints shall be designed for an “Importance Factor”, Ip= 1.0, except all fossil fueled equipment shall have Ip=1.5. Seismic design category shall be “C".

2. Manufacturer of seismic control products shall have the following responsibilities:
   A. Determine and submit seismic restraint sizes, locations, and catalogue cut sheets.

   B. Provide piping and equipment seismic restraints as required by code.

   C. Submit calculations to determine restraint loads resulting from seismic forces presented in IBC, International Building Code. Seismic calculations shall be certified by a licensed engineer.

   D. Submit anchor bolt calculations, signed by a qualified engineer licensed in the State of South Carolina, showing adequacy of bolt sizing and type. Calculations shall be furnished for anchors on restraint devices, cables, isolators and rigidly mounted equipment. Calculations shall specify anchor bolt type, embedment, concrete compressive strength, minimum spacing between anchors and minimum distances of anchors from concrete edges. Concrete anchor locations shall not be near edges, stress joints, or an existing fracture. All bolts shall be ASTM A307 or better.

   E. Provide installation instructions and project site visits.

   F. Provide a letter certifying installation of the seismic restraints.

   G. Materials and equipment requiring restraints shall be as follows:

Seismic Category C:

1. Gas fired water heaters

Specified: Seismic Control and Specialties
Substitute: Mason, Amber-Booth, Kinetics Noise Control, VMC, Vibro-Acoustics.

ANCHOR BOLTS:
Provide all necessary anchor bolts for placing in form work before concrete is poured. Bolts shall be of suitable type for load and purpose and shall be accurately spaced.

CUTTING AND PATCHING:
The Contractor shall do all necessary cutting of walls, floors, partitions, roof, etc., to properly install his work. Care should be exercised in cutting to avoid unnecessary damage. Cutting shall be accomplished with sawing and drilling actions, not hammer and chisel. Some cutting may be executed by the General Contractor; see architectural drawings for extent of General Contractor cutting.

PAINTING:
Any exposed metal installed by this contractor (except where concealed above the ceiling) which is not insulated, galvanized or previously painted shall be properly prepared and cleaned and given a zinc rich prime coat and a final coat of black protective enamel.

All gas pipe (regardless of location) shall be painted as indicated above except the color shall be yellow.

CONCEALED PIPE:
In general, all piping in floors, ceilings, and walls of finished spaces shall be run concealed. Cooperate with other trades in layout of chases and concealment of piping. Chases will be provided as the building progresses. This Contractor shall designate required chases, and failure to designate chases shall require this Contractor to cut and patch same.

LEAD FREE (POTABLE WATER):
All piping, fitting, valves, accessories, and materials in use for domestic potable water service shall meet the definition of "lead-free" as defined by the Safe Water Drinking Act, Section 1417. Lead content shall not be more than 0.25% of the wetted surface material.

PIPING MATERIALS:

A. Potable Water Piping (copper):
Water pipe shall be copper unless noted otherwise:

Unless noted otherwise, water piping below grade or under the concrete floor slab shall be Type “K” hard copper tubing with wrought sweat fittings. At the contractors, option, ¾” and smaller underground water pipe may be Type “K” soft copper with elbows formed with a bending tool.

All water piping within the building and above ground shall be Type “L” hard copper tubing with wrought sweat fittings.

Fittings and tubing shall conform to ASTM B 88.

B. Gas Piping:
Paint all exposed gas piping. See PAINTING section of these specifications.

Pipe:
1. Aboveground:
Pipe Schedule 40, steel pipe complying with ANSI Standard B36.10-1970, ASTM A-53 or A106

2” and smaller:
inside the building; socket welded joints
outside the building; threaded and screwed joints

2 1/2” and above:
inside and outside the building; welded and flanged joints

Fittings:
Screwed: 150 pound class, black malleable iron

Welded: 150 pound class, Schedule 40, steel, ends beveled for welding or socket fitting

Unions: 150 pound class, black malleable iron, screwed, ground joints, bronze to iron seat

Flanges: 150 pound class, forged steel, weld neck or slip on, flat faced and drilled, with gasket

Flexible Connectors:
300 series stainless steel corrugated hose with 304 stainless steel braided cover. UL listed and CSA/AGA certified. 175 working pressure at $70^0$F. Maximum 18” length. By Flex-Hose, Metraflex, Mason

Thread Sealant: Teflon tape, ½" wide x 3 mil thickness, scotch brand or equal

Service Valve / Gas Cocks:
400 pound WOG, full port, bronze body, screwed end, rated for natural gas service, U.S. made: Crane, Hammond, Grinnell, Nibco, Stockham, Milwaukee, Apollo

PIPE JOINTS:

A. Copper Pipe:
Shall be cut true and square. Shall be reamed inside and ends shall be polished outside with emery cloth where it enters fittings. All fittings shall be polished inside and coated with a flux as recommended by the solder manufacturer. All solder shall be lead free.

B. PVC Pipe (Drain and Waste):
Pipe shall be assembled with solvent joints in accordance with ASTM 2855 latest revisions. Solvent cement shall conform to ASTM Standard D 2564-88, and with purple primer ASTM F656.

PIPE TESTING:
The entire sanitary, drainage, vent, and water systems shall be tested by the Contractor in the presence of and to the satisfaction of the local Plumbing Inspector and representative of the Architect/Engineer, in compliance with the State and Local Code regulations.

Contractor shall make all necessary preliminary tests to be sure that the piping system are tight, then he shall notify the Architect that the tests are ready for inspection. The Architect/Engineer will then advise the Contractor when the test is to be demonstrated for approval. No work shall be covered until approved by the local plumbing inspector and/or Architect/Engineer.

Do not pressure test any portion of any existing system with the new system.

A. Potable Water Piping (Copper):
Copper Piping - Shall be tested to 150 psi by hydrostatic pressure before they are covered, and shall remain absolutely tight for a period of at least (2) hours.

B. Outside Sewer – Test outside sewer pipe for leakage when required by DHEC officials.

C. Gas Piping – Shall be tested as required by the International Gas Code, but not less than 60 psi for 2 hours. Contractor shall furnish a letter certifying that all gas piping has been installed and tested in accordance with the International Gas Code.

Provide a letter to the engineer certifying that all gas pipe has been tested in accordance with the Standard Gas Code. The letter shall include date tested, pressure, duration, and witnesses.

PIPING VALVES:
All valves shall be of the brass, lead free, 125 lb. W.S.P. class. Valves shall be installed with handles turned up where possible and not below the horizontal position.

All above ceiling service valves shall have the location indicated on the ceiling tile directly below the valve with a ¾" diameter red dot.

General service valves shall be ball type, unless noted otherwise.

Ball Valves shall be 600 lbs. WOG, two-piece full port:
Milwaukee, Crane, Apollo, Nibco, Stockham, Hammond, Grinnell, Kitz

Throttling valves shall be globe type:
Stockham B-22 or B-24, Nibco T-235-Y or S-235-Y, Crane #7 or #1310, Hammond, Milwaukee, Kitz, Grinnell, Apollo

Check valves shall be:
Stockham B-319 or B-320, Nibco T-413-B or S-413-B, Crane #37 or #1342, Hammond #IB940 or IB941, Milwaukee #509 or 1509, Grinnell #300, Apollo #161T, Kitz #822T or 823T

Calibrated Balancing Valves:
Valve shall be lead-free brass construction. Valves shall have integral pointer to indicate degree of valve opening, (2) temperature/pressure ports, and memory stop. Valve shall be rated for 300 psig working pressure. Bell & Gossett “Circuit Setter”, Taco, Tour-Anderson, Nexus, Wheatly, Danfoss.

PIPE LABELS: Provide a color coded name tag for each pipe system. In mechanical room labels shall be 25’o.c.; above ceilings, pipe labels shall be 75’o.c. Pipe labels shall be as follows:

a. Potable hot water
b. Potable hot water return
c. Potable cold water

REDUCERS:
Changes in pipe sizes shall be made with reducer or reducer fittings. No bushing shall be used, except where specifically called for, or with special permission. Changes from bell and spigot cast iron pipe to screw pipe shall be made with cast iron threaded reducers, caulked into hub.

PIPE SLEEVES AND PLATES:
Water piping passing through walls, ceilings, floors, in or under concrete slabs, beams, or any portion of the building structure, shall be free to expand and contract and shall not be embedded in plaster, concrete or masonry. Such piping shall be provided with steel sleeves or thimbles when passing through concrete or masonry walls, ceilings, floors or beams, and such sleeves or thimbles shall be at least three-eighths (3/8) inch larger than the outside diameter of the pipe plus the insulation. Annular spaces between sleeves and pipes in the floor slab shall be filled or caulked with a non-hardening mastic.

Sleeves for insulated pipe shall be of sufficient size to allow the insulation to continue through the partition.

Exposed pipes shall be fitted with chrome plated steel escutcheon plates.

FIRE STOPPING:

1. All pipe penetrations of a fire rated wall, partition or floor shall be secured against the passage of smoke and fire with a UL listed assembly.

2. Steel piping which is not subject to expansion and contraction shall be grouted solid into the wall (UL Fire Resistance Directory, 1996, System #CAJ1001). This piping shall include storm drains, waste, sewer and venting.

3. Steel and copper piping which is subject to expansion and contraction because of carrying a fluid, under pressure, of varying temperatures shall be protected with a steel sleeve (schedule 10) around the pipe grouted solid into the wall, floor or partition and also sealed with UL approved fire stop materials. The firestop method shall not lock the insulation or pipe against movement. See details on the drawings.

HANGERS AND SUPPORTS:
All piping, whether exposed or concealed, shall be substantially supported and made secure. Refer to Code and to pipe manufacturer's recommendations for hanger intervals. For acid pipe refer to manufacturer recommendations for hanger interval.

All cold and hot water piping shall be suspended by means of iron rods and hangers similar to Anvil Fig. CT-69, CT-65, or 260 with insulation saddles.

Drain, waste, and steel vent piping shall be supported by iron rods and wrought iron hangers similar to Anvil Fig. 260.

Plumbing Contractor shall provide angle iron between joists where required for attachment of hanger rods.

Hanger attachments to fire protected steel shall be mounted prior to spray application of the fire protection.

TANKLESS CONDENSING GAS WATER HEATERS:
PERFORMANCE REQUIREMENTS

- Heat exchanger shall have the ANSI and CSA marks for the United States and Canada and AHRI certification for the United States and Canada.
- UL certification controller for recovery and external recirculation marks for the United States and Canada.
- Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and use.
- ASHRAE/IES Compliance: Fabricate and label fuel-fired, domestic-water heaters to comply with ASHRAE/IES 90.1.
- Comply with efficiency requirements in ASHRAE 189.1, which supersede requirements in ASHRAE/IESNA 90.1.
- NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61 and NSF 372.
- Energy Star Compliance: Fabricate and label equipment in compliance with Energy Star requirements.
- Water heater shall meet NSF 5 construction standards
- Water heater shall be approved for elevations up to 10,200 ft or (3,109 m).
- Water heater shall comply with SCAQMD Rule 1146.2 Type 1 Compliance: Provide units with low nitrous oxide emissions that meet or exceed 14 ng/j or 20 ppm NOx requirements at 3%.

System Requirements

- General: Provide tankless condensing water heater with microprocessor control and a direct electronic ignition system (with no standing pilot), fully modulating gas control valve, turbine flow meter, automatic electro-mechanical water flow control valve, and water temperature thermistors to maintain outlet water temperature between ± 2°F of set point temperature. Microprocessor shall have built in recirculation logic to control a pump's heating cycles.
- Controls: Provide an integrated temperature thermostat with an adjustable set point range of 96°F to 185°F.
- Error Memory: Provide water heater with no less than nine diagnostic maintenance codes that can be read via the display on the temperature thermostat controller.
- Emissions: Provide water heater that produces no more than 20 ppm NOx emissions when tested in accordance with the rules and regulations of the South Coast Air Quality Management District.
- Burners: Provide tankless water heater with downward fired fiber mesh burners, solid brass water flow control valve, and solid brass inlet and outlet water connections.

- Junction Box: Provide pre-installed electrical junction box.
- Heat Exchanger Construction: 400 series stainless steel.

Indoor Tankless Gas Water Heaters.

A. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.
   1. Basis of Design Product: Navien NPE, Model 240.
   2. Uniform Energy Factor: 0.96.
   3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
   4. Fuel: Natural Gas or Propane.
      a. Gas Consumption: 13,300 to 199,900 Btu/hr.
      b. Gas Supply Pressure:
         1) Natural Gas: 3.5 to 10.5 inches of water column.
         2) Propane: 8.0 to 13.5 inches of water column.
   5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
      a. Normal Usage: 52 Watts.
      b. Max Current: 4 Amps.
   6. Hot Water Flow Rate Capacity: 11.2 GPM at 35°F temperature rise.
   7. Pressure Rating: 150 psi
   8. Heat Exchanger: Dual, stainless steel heat exchangers.
   9. Freeze Protection: For ambient temperatures as low as –5°F.

TANKLESS RACK SYSTEMS

B. Tankless Free-Standing Rack System.
   1. Capacity: Single unit, front mounted or Two unit, mounted Back to back.
   2. Rack Frame: 1.5 inch square tube 14 gauge hot rolled steel.

VENTING

C. Water heater can be approved for vending with polypropylene or schedule 40 PVC/CPVC vent material.

D. Water heater shall be capable of operating on a common vent system, allowing up to twelve (12) units to vent through 6” vent diameter in the same system.

E. Water heater vent system shall be capable of operating with vent intake and exhaust in different pressure planes.

F. Where common vented, provide dampers that allows venting without check valves.

Warranty
Manufacturer’s Warranty: Manufacturer agrees to replace products that fail within the specified warranty period.

Failure Methods: Condensate corrosion, thermal stress, mechanical defects, or workmanship.
Heat Exchanger: 15 years from date of Substantial Completion under standard or controlled regulation.

All Other Parts and Components: 5 years from date of Substantial completion.

Specified: Navien

Substitute: Rinnai, Intellihot

COMBUSTION VENTS:
Positive Pressure Vent: The vent shall be polypropylene, designed for use with Category II, or IV condensing gas fired appliances

All products furnished under this Section shall conform to the requirements of The National Fuel Gas Code, ANSI Z223.1/NFPA-54 where applicable and shall comply with and be listed to UL-1738, the US Standard for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV, and ULC-S636-95, the Canadian Standard for Type BH gas vent systems.

A. The vent shall be of the single wall, factory-built type, designed for use in conjunction with Category II, or IV condensing gas fired appliances, condensing oil-fired appliances or as specified by the heating equipment manufacturer.
B. Maximum continuous flue gas temperature shall not exceed 230 degrees F (110 degrees C).
C. Vent shall be listed for a maximum positive pressure rating of 20" w.c.
D. The vent system shall be continuous from the appliance's flue outlet to the vent termination outside the building. All systems components shall be UL/cUL listed and supplied by the same manufacturer.
E. The vent shall be constructed from Flame Resistant Polypropylene.
F. All systems components such as vent supports, roof or wall penetrations, terminations, appliance connectors and drain fittings required to install the vent system shall be UL/cUL listed and provided by the vent manufacturer.
G. All systems components shall include a factory- installed gasket in their female-end to render the vent air and water tight when the male/female ends are pushed together as per manufacturer's instructions. Vent systems requiring field installed sealants or compounds shall not be acceptable.
H. Vent layout shall be designed and installed in compliance with manufacturer's installation instructions and all applicable local codes.

The vent system shall be routed for zero clearance to combustibles as specified by the manufacturer.

Stack shall extend a minimum distance above roof elevation, in accordance with manufacturer's instructions.

Chimney manufacturer shall provide calculations for each vent system. Chimney manufacturer shall provide all dampers and accessories necessary to ensure proper draft, per the vent calculations. Submit calculations with shop drawings.

The manufacturer shall warrant the Positive Pressure Vent System against defects in material and workmanship for a period of 10 years from the date of the original installation. Any portion of the vent repaired or replaced under the warranty shall be warranted for the remainder of the original warranty period.

Specified: Centrotherm
Substitute: By prior approval

HOT WATER CIRCULATOR:
Provide an all-bronze or all stainless-steel, wet-rotor circulator with high-efficiency, electronically commutated, permanent magnet motor; multi-speed settings; sized as noted on the drawings. Motor shall be non-overloading. Provide starter with magnetic contactor for remote start-stop.

Specified: B&G
Substitute: Grundfos or Taco

INSULATION:
Insulation on services under this section of work shall be installed by workmen regularly engaged in insulation installation.

Test, inspect, and clean surfaces on piping before applying the insulation.

Sectional insulation for copper tubing shall be sized for the outside diameter of the tubing.

Insulated pipe shall have 18" length of high density, 25/50 rated, 19 psi compressive strength, isocyanurate (or 25/50 rated, 80 psi compressive strength calcium silicate) at each pipe hanger for pipes 4" and larger. Pipes less than 4" shall have a 12" long insert. Pipes 1" and smaller shall not require insert.

Insulation shall be installed in accordance with Manufacturer's recommendations.

Provide firestop at all penetrations of fire rated floors and partitions. Refer to detail on drawings.

Types of insulation for the various services shall be as follows:

1. Cold Water Lines Above Grade: Shall be insulated with factory applied self-sealing pressure sensitive seams or glued elastomeric rubber based pipe insulation. Fittings shall be insulated with same material. The insulation shall have a 25/50 frame spread and smoke developed rating per ASTM E85-75 test method and 6.0 lb/cu.ft. density. Cold water piping shall have ½" thickness.

   Specified: Armaflex
   Substitute: K-Flex, Aeroflex

2. Hot Water Lines Above Grade: Unless noted otherwise, all hot water above grade shall be insulated with high density, 1" thick fiberglass pipe insulation with all service jacket and self-sealing lap joints. Insulate fittings with same material and jacket with Zeston or Speedline P.V.C. pre-moulded fitting covers.

   At contractors' option, hot water risers in walls shall be insulated with 1" thick Armaflex. (25/50 frame spread and smoke developed rating per ASTM E85-75 test method; 6.0 lb/cu.ft. density.)

3. Downspouts: Shall be insulated with high density, 1" thick fiberglass pipe insulation with all service jacket and self-sealing lap joints. Only horizontal downspout lines from drain to and over elbow at top of risers shall be insulated. Insulate fittings with same material and jacket with Zeston P.V.C. pre-moulded fitting covers.

4. Roof Drains: Insulate the base of each roof drain with 1" thick sheet applied with adhesive; Armaflex, K-Flex, or Aeroflex.

5. Condensate Waste: Overhead drains receiving HVAC condensate or a drain from an ice machine shall be insulated with a ½ inch thick Armaflex, K-Flex, or Aeroflex.

PLUMBING FIXTURES:
Fixtures and accessories shall be as follows:

| | |
|---|---|
| Fixtures: | Kohler, American Standard, Zurn, Ceco (lavatory only) |

| | |
|---|---|
| Faucets: | Chicago, T&S Brass, Zurn, Moen, Delta (“Cer-Teck” Series) or by fixture manufacturer |
| Sinks: | Elkay, Just, Acorn |
| Stops & Accessories: | Brasscraft, McGuire, EBC, Zurn, Keeney, Dearborn Brass, or by fixture manufacturer |

Submit shop drawings on all fixtures and accessories, including stops and traps.

All fixtures shall be first quality of their respective makes and shall be properly handled, carefully uncrated, erected and set in place. On completion, all fixtures shall be properly cleaned and adjusted and left in readiness for use. The Contractor shall assume all responsibility for the proper protection of all fixtures to insure that same shall be in good condition for acceptance.

Exposed metal parts of all fittings, unless otherwise noted, shall be polished chromium finish on nickel, plated brass. All cast iron enameled fixtures shall be in ACID RESISTING enamel.

All fixtures shall have individual cut-off stops on cold and hot water lines where same are not specified as part of the fixture, they shall be installed in supply lines as close to fixture as possible.

All P-traps shall be cast brass with cleanout, 17 gauge tubing outlet, and cast brass nuts.

Supply stops shall have screw or ferrule/compression connections and have brass body and stem and chrome plated. Connect to roughing with chromed nipples or supply stop with extension tube and chrome plated copper pipe risers (stainless steel braided hose connections are acceptable where provided by the fixture manufacturer and concealed by millwork). Stops to exposed lines shall be key operated and concealed stops shall have hand wheel.

Refer to Architectural drawings and to the Fixture Schedule for roughing heights.

On masonry walls, wall hung fixtures shall be installed by thru-bolting the hanger brackets to the wall with 3/8” toggle type anchors and washers. (For anchors in solid concrete walls or block webs, use expansion bolts.) Install minimum (6) anchor bolts per fixture. On stud wall construction, provide 2” thick by 8” wood blocking between studs and anchor hangers into the blocking with 3/8” diameter lag bolts and washers. Wall hung lavatories shall have heavy duty steel/ductile iron carriers.

Connections of fixtures to piping shall be complete and substantial, using proper bolts, anchors, screws, etc., for supporting of all fixtures to avoid strain on connections. Determine the exact finished floor and wall surface before installing pipes, etc.

Complete connections for all fixtures, traps, wastes, vents, hot and cold water, etc., shall be provided.

All fixtures for the handicapped shall meet A.D.A. requirements. Water closet flush valve handles shall be right or left hand, to match the wide side of the handicapped stall. Coordinate flush valve height above floor with ADA grab bars locations.

Lavatories shall have offset tail piece and trap (where required for ADA accessibility compliance) and preformed white foam covers.

All fixtures shall have the joint between the fixture and the mounting surface caulked with white silicone caulk/sealant.

Sink and lavatory faucets shall have ceramic cartridges.

P-1 Lavatory (ADA): Kohler “Farmington” #K-2905 enameled cast iron, self-rim-ming 19”x 16”, oval counter top lavatory with T&S Brass B-2711 single handle faucet and with #K-7129-A perforated grid strainer. Where required for ADA accessibility compliance, provide with McGuire 155w.c. offset trap and tail piece assembly. Provide with 0.5 GPM aerator.

END OF SECTION

Section 23 00 01 – HEATING, VENTILATING, AND AIR CONDITIONING

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Section 23 00 01 – HEATING, VENTILATING, AND AIR CONDITIONING

CONTRACTOR QUALIFICATIONS:

All Mechanical Contractors shall meet the following minimum criteria. This criteria shall be part of the contract bid documents.

1. Contractors shall have been in business a minimum of five (5) years from the duration of the project consecutively under their current name and current registration with the SC Secretary of State.

2. Contractors shall have experience in the construction of similar projects in the State of SC. A list of at least five (5) years completed projects of similar scope and size which shall be submitted before issuance of a purchase order.

3. Contractors shall be individually bondable in the state of South Carolina by a surety in accordance with AIA-201.

4. Contractors, its principal operators, license holders, or corporate shareholders shall not have been involved in bankruptcy proceedings in the contracting business within the last ten (10) years or be involved in pending actions concerning bankruptcy in the contracting business.

GENERAL PROVISIONS:
The Instructions to Bidders, General Requirements, General Conditions of the Contract and the Supplementary General Conditions shall form a part of the specifications for this work insofar as they apply to these Heating, Ventilating, and Air Conditioning Specifications.

A. The scope of work to be provided under these specifications includes the furnishing, delivering, unloading, handling, erection, adjusting, and testing of all materials, equipment and apparatus which are required for the completion and correct operation in all respects of the Heating, Ventilating, and Air Conditioning system as indicated on the drawings and specified herein.

B. Certified vendor shop drawings shall be utilized for dimensions, connections, etc., of all equipment. Contractor shall refer to Architectural drawings for exact building dimensions, construction details, etc.

C. The Contractor shall be responsible for coordination with all disciplines at the job to insure proper installation of the system with no interferences and with proper clearance. The progress of the work shall conform with and not delay the work of other trades. The entire installation shall be completed as soon as the condition of the building will permit.

D. All equipment shall be installed in strict accordance with manufacturer's recommendations and instructions. These instructions shall be considered as a part of these specifications.

E. Full opportunity shall be given to the Architect/Engineer or third party inspectors, to make any inspections as desired, of all phases of construction and equipment. Any work which is being improperly installed may be rejected as specified in the General Conditions.

F. All mechanical equipment and materials delivered and accepted for subject job, shall become the responsibility of the contractor. Contractor shall be liable in the event of theft, loss, destruction, etc. All materials shall be properly protected from weather, moisture, or damage in any way. Water saturated fiberglass duct & pipe insulation shall be removed and replaced.

G. Pipe and duct routing shall conform as close as possible to locations as indicated on the contract drawings. Additional offsets, fittings, etc., required due to conflicts with trades and/or to meet field conditions shall be furnished and installed as necessary.

H. All bidders shall visit the job site and familiarize themselves with existing job conditions, as no extra cost will be allowed because of additional work necessitated or required by job conditions, unless same is brought to the attention of the Architect/Engineer prior to receipt of bids.

SHOP DRAWINGS:
After award of the contract, the successful contractor shall submit shop drawings of all items of equipment so noted in the respective sections of these specifications. Shop drawings shall be submitted as noted under the General Requirements of these specifications. Except under special permission, orders shall not be placed until shop drawings have been reviewed by the Engineer. Submittals shall be project specific; generic submittals will not be accepted.

An electronic PDF will be acceptable, but must also have at least one paper copy submitted to the engineer. Electronic copy alone is unacceptable. Paper copy must be prepared and printed by the submitting vendor.

Where required by local code officials, provide manufacturer's equipment installation literature.

OPERATION OF HVAC EQUIPMENT DURING CONSTRUCTION:
Indoor air quality, management and cleaning shall be in conformance with SMACNA "IAQ Guidelines for Occupied Buildings under Construction", 1995, Chapter 3. When the Owner's HVAC equipment is operated during construction, the General Contractor shall make every precaution to protect the HVAC system during operation, such as keeping all filters clean, avoiding system operation with windows or doors open, and avoiding system operation when sanding, sweeping, and painting, etc., is being done. The General Contractor shall also be responsible for extended warranties as required to meet the minimum specified after Substantial Completion.

Grilles, registers and diffusers shall be protected during construction; including, at a minimum, locating filtration media on the surface of all return air devices (if fans will be operated during construction). All open ends of ductwork shall be covered with protective membranes.

Equipment must be cleaned throughout to original factory conditions, prior to owner's acceptance.

Equipment filters must be minimum MERV 8 rated efficiency during construction, and shall be replaced with MERV 8 at date of occupancy. Any return air ductwork, openings, and/or air devices shall be protected with MERV 8 filter media.

Refer to Specifications General Requirements for additional clarification of the General Contractors responsibilities.

If the condition of ductwork or equipment requires professional cleaning (as determined by the Engineer), an independent, NADCA certified contractor shall be engaged by the mechanical contractor at no additional cost to the owner.

DUCTWORK CLEANING:
Ductwork cleaning shall be performed by an independent contractor which specializes in this work. Contractor shall be NADCA certified. A minimum of (2) NADCA certified technicians shall be on site at all times during cleaning.

All duct cleaning shall be performed in accordance with the applicable sections of the most current version of "ACR, The NADCA Standard for Assessment, Cleaning, and Restoration of HVAC Systems".

Specified: Carolina Air Care (Contact John Cain, 895-9500)
Substitute: By prior approval

AS-BUILT DRAWINGS:
Mark any changes in pipe or duct routing, equipment, or deviations from Contract Drawings on clean set of prints and a digital file; deliver to architect for transmittal to owner at completion of contract.

SUBSTITUTE EQUIPMENT:

A. In the event the Contractor substitutes any equipment or materials in lieu of that indicated on the drawings and specified; any change in service connections (electrical, structural, piping, controls, drains, etc.) or fire rating or any related items, shall require the contractor to make all necessary coordination changes. The contractor shall assure that the changes do not alter the system functions as intended with original equipment.

B. All materials and equipment shall be new and shall conform to the grade, quality and standards of those specified.

C. Design of the system is based on installation of specified materials and equipment. Other materials and equipment may be used subject to prior approval by the Architect. Approvals granted will be issued by addenda to the specifications. Request for prior approval shall be made in writing ten (10) days prior to the bid date.

D. The substitute manufacturers listed in these specifications shall be acceptable substitutes if they meet the specifications in all respects.

PHASING:
Refer to construction phase and schedule requirements in specifications section 01 10 00.

ACCEPTANCE AND COMPLETION OF JOB:

A. Upon completion of the job, the contractor shall furnish to the owner three complete sets, in ring binders, of all equipment instructions, including: guarantees, operation, maintenance, and installation data. Contractor shall also provide the information listed above in electronic PDF format, on a portable flash drive.

B. The contractor shall furnish the Engineer with a signed statement from the owner's representative to the extent that operation of the system is thoroughly understood for making minor adjustments in the operation and in maintaining the equipment. Provide owner training for the entire system operation. Where indicated in the "Equipment" section of these specifications, equipment training shall be provided by the equipment manufacturer's representatives.

C. After work has been completed, tested, and adjusted, the systems shall operate for five 8-hour days under normal operating conditions to demonstrate that they fulfill requirements of the plans and specifications and that they operate satisfactorily.

D. All equipment and materials shall be thoroughly cleaned and spot painted as required.

E. Furnish record drawings from HVAC and controls contractor.

F. Furnish Test & Balance Report.

G. Furnish Boiler Combustion Test and Start Up Report.

H. Furnish the Engineer with a signed statement from the owner's representative acknowledging receipt of extra air filters, where required by these equipment specifications.

I. Furnish a letter certifying testing of the gas pipe. See "Gas Pipe" in these specifications.

J. Furnish a letter certifying installation of Code required Seismic restraints.

K. Provide a letter from the chemical treatment contractor that all required piping systems are flushed, cleaned, and passivated.

L. Clean all cooling and heating coils and ductwork loaded with dust/dirt during the construction phase of the work, i.e. any air handling terminals used to condition the building during the construction phase.

M. Demonstrate clean piping strainers to the owner.

GUARANTEE:
The Heating, Ventilating, and Air Conditioning contractor shall guarantee the entire system for two (2) full years from date of substantial completion. This guarantee shall include all materials and labor as required

to correct any deficiencies in the equipment. The cost of said guarantee shall be a part of the original contract bid and shall not bear any additional expense to Owner. Any adjustments or corrections made within the guarantee period shall be equal to the quality of materials and workmanship originally called for and shall be subject to inspection and acceptance by the Architect/Engineer.

Equipment warranties shall commence at date of Substantial Completion.

PERMITS:
The Contractor shall obtain and pay for all permits, utility connections, and all fees otherwise required for the work.

CODE:
All work shall be installed in accordance with the International (and SC) Mechanical Code, International (and SC) Fuel Gas Code, and other applicable local codes. Where specified materials and methods exceed minimum Code requirements, the drawings and specifications shall supersede the Code.

Coordinate site visits and inspections with code officials or third party inspectors.

Any inadequate or undersized electrical hardware or wiring shall be replaced.

CUTTING AND PATCHING:
Execute all necessary cutting of walls, floors, partitions, roof**,** etc., to properly install the work.
Care shall be exercised in cutting to avoid unnecessary damage where openings are required.

Some cutting to support the mechanical work may be accomplished by the General Contractor, refer to Architectural drawings for the extent of this work.

Cutting of building surfaces shall be accomplished with sawing and drilling, not chisels and hammer action.

Any work that compromises the existing building's fire proofing shall be patched and repaired to its original condition.

EXCAVATION AND BACKFILLING:
Execute all excavations and backfilling required for the installation of work under these specifications. Bottom of trench for underground piping shall be excavated to an even, smooth grade. All backfill shall be thoroughly tamped. All surplus earth shall be removed from building site and disposed of as directed by the owner. Provide necessary shoring for protection of trenches. Provide trench sand bed and backfill as required by other sections of these specifications.

Trench backfill shall be compacted to 90% in non-traffic areas and 95% in traffic and paved areas based on Standard Proctor Test (ASTM D 698). Backfill shall be tamped at a maximum of 12" layers.

UTILITY PIPING IDENTIFICATION:
For all outside underground piping; one foot (1 ft.) below grade and directly above each underground pipe, lay a polyethylene marking tape in the trench during the backfill. The tape shall be inscribed with a warning of "caution, underground piping below".

Additionally, adjacent to each plastic pipe and at the same elevation as the pipe, lay a single strand, 14 gauge, bare copper wire for signal location. Terminate the wire (from both directions) at the building foundation and at the entrance to the valve pit so that it will be accessible for connection to signal generator.

WELDING:
All welding shall be accomplished by certified welders, in accordance with ASME Section 9.

PAINTING:
Any exposed metal installed by this contractor and all pipe which is not insulated, galvanized or previously painted shall be properly prepared and cleaned and given a zinc rich prime coat and a final coat of black protective enamel, (except where concealed above the ceiling or located in a mechanical mezzanine).

Unless noted otherwise on the plans, all gas pipe (regardless of location) shall be painted as indicated above except the color shall be yellow.

FIRE STOPPING:
1. All Pipe and duct penetrations of a fire rated wall, partition or floor shall be secured against the passage of smoke and fire with a UL listed assembly.

2. Steel piping which is not subject to expansion and contraction shall be grouted solid into the wall (UL Fire Resistance Directory, 1996, System CAJ1001). This piping shall include drains and vents.

3. Steel and copper piping which is subject to expansion and contraction (because of carrying a fluid, under pressure, of varying temperatures) shall be protected with a steel sleeve (schedule 10) around the pipe, grouted solid into the wall, floor or partition, and also sealed with UL approved fire stop materials. See details on the drawings.

4. Ductwork shall have fire dampers (where indicated on the floor plans) sealed with fire caulking and metal flanges. See details on drawings.

WIND AND SEISMIC RESTRAINTS:
1. Equipment, piping, and ductwork shall be restrained to resist wind and seismic forces. Restraints shall maintain equipment, piping, and duct work in a captive position. Restraint devices shall be designed and selected to meet the wind and seismic requirements as defined in the latest edition of the IBC (International Building Code).

   Seismic Restraint:
   All restraints shall be designed for an “Importance Factor”, Ip= 1.0, except all fossil fueled equipment shall have Ip=1.5. Seismic design category shall be “C”

   Wind Restraint:
   All restraints shall be designed for a wind speed at 110 mph (3 second gust).

2. Manufacturer of seismic and wind control products shall have the following responsibilities:
   A. Determine and submit seismic and wind restraint sizes, locations, and catalogue cut sheets.

   B. Provide piping, ductwork and equipment seismic restraints as required by code.

   C. Submit calculations to determine restraint loads resulting from seismic and wind forces presented in IBC, International Building Code. Seismic and wind calculations shall be certified by a licensed engineer.

   D. Submit anchor bolt calculations, signed by a qualified engineer licensed in the State of South Carolina, showing adequacy of bolt sizing and type. Calculations shall be furnished for anchors on restraint devices, cables, isolators and rigidly mounted equipment. Calculations shall specify anchor bolt type, embedment, concrete compressive strength, minimum spacing between anchors and minimum distances of anchors from concrete edges. Concrete anchor locations

shall not be near edges, stress joints, or an existing fracture. All bolts shall be ASTM A307 or better.

E. Roof Curb submittals shall be stamped by a qualified engineer licensed in the state of S.C.

F. Provide installation instructions and project site visits.

G. Provide a letter certifying installation of the seismic restraints.

H. Materials and equipment requiring restraints shall be as follows:

Seismic Category C:
1) Piping over 6" diameter and with pipe hangers over 12" in length
2) Gas fired boilers and pads
3) All roof, wall, and floor mounted gas piping.
4) Suspended gas piping over 2" diameter, if suspended greater than 12" from the structure.

Wind:
1) All rooftop equipment

Specified: Seismic Control and Specialties
Substitute: Mason, Amber-Booth, Kinetics Noise Control, VMC, Vibro-Acoustics, Caldyn

DEMOLITION:
All materials and equipment removed shall become the property of the contractor and shall be disposed of by the contractor.

Any materials and equipment which the Owner wishes to salvage shall be removed by the Owner prior to the start of the Contractor's works. Coordinate with Owner.

Asbestos removal shall be by the Owner. If the Contractor suspects an area contains asbestos, the Owner/Architect should be contacted immediately.

No demolition with cutting torches shall be allowed in finished areas of the building.

See notes on drawings for extent of demolition.

PIPING Equipment :

A. Shop Drawings: Submit shop drawings for all valves, accessories, and insulation.

Quality of the Work:
With the installation of all piping and all accessories, the fit and finish shall be in accordance with a high standard of skilled craftsmanship, and with established standards of the trades and shall be neatly mounted square and plumb to the building surfaces and structures.

Unless indicated otherwise on the plans, all above ground piping and accessories shall be installed concealed in the walls or above ceilings. Any piping and accessories indicated to be installed exposed to view shall have an approved sheet metal cover, painted to match the adjacent surfaces.

B. Sleeves and Inserts: Piping passing through walls, ceilings, floors, in or under concrete slabs, beams, or any portion of the building structure, shall be free to expand and contract and shall not be embedded in plaster, concrete or masonry. Such piping shall be provided with steel sleeves or thimbles when passing through concrete or masonry walls, ceilings, floors, and such sleeves or

thimbles shall be at least three-eighths (3/8) inch larger than the outside diameter of the pipe plus the insulation. Annular spaces between sleeves and pipes in the floor slab shall be filled or caulked with a non-hardening mastic. Sleeves for insulated pipe shall be of sufficient size to allow the insulation to continue through the partition.

For pipe penetrations of fire walls refer to details on drawings.

C. Cleaning and Flushing Water Piping:
After the piping system has been tested for leaks and certified tight and leak proof, prior to making the final connections to the terminal units, the branch lines at each terminal shall be cross connected.

The entire system is to be pre-flushed for 24-48 hours (depending on the quality of water) making sure that everything is opened prior to the addition of any cleaning chemicals.

Coordinate with control contractor to insure that all control valves are open during this entire process. Where the building wings or floors are brought on in phases, due to the construction schedule, each subsequent phase added to the main shall also be flushed and treated as indicated in this specification.

Drain system until water runs clear.

Make sure system is completely filled with clean water and circulated through all parts before adding recommended amount of cleaner. Treatment company to provide cleaner.

Chemical shall be a dispersant for mill scale, cosmoline, cutting fluid, pipe joint compound, etc. Insure all high points have to be vented. After adding the cleaner, circulate for 48 hours, after this time clean all strainers.

Flush system completely paying special attention to all low points. This will insure all cleaner and impurities are flushed out.

Refill system with clean water and contact chemical treatment representative to test system water prior to introduction of pre-passivation and regular treatment chemical into system.

To avoid new corrosion, the water treatment representative should be present to immediately test the water to be sure that all pre-cleaner has been flushed from the system.

Pre-passivation and regular treatment chemical should be immediately added after successful testing. There should be no lapse of time between the flushing of the pre-cleaner and the refill of new clean water with pre-passivation and regular treatment chemical.

The chemical treatment representative is to be notified prior to flooding any system. This insures that the initial water treatment and corrosion inhibitors can be added to the system when it is flooded.

Provide a letter to the owner, certifying that the system has been properly cleaned, treated, and suitable for service.

At the Date of Substantial Completion demonstrate to the owner/engineer that all strainers are clean.

D. Testing:
1. General
a. The contractor shall provide all caps, plugs, fluid flanges, temporary connections, etc., as required to meet the testing procedures. Also provide all necessary testing equipment, i.e., gauges, pumps, leak detectors, etc.

b. The code officials and/or the owner's third party inspectors shall be contacted prior to the test and shall observe the test procedure.

c. ***Do not*** test any existing piping with new piping.

d. The contractor shall make all necessary preliminary steps to insure that the piping system is completely tight.

e. All terminal equipment not rated for the test pressure shall be valved off or otherwise isolated from the system.

2. Hydrostatic Testing:
Fill the system with clean water and ensure all valves are open and all high points vented and with no air binding. Contractor shall then maintain the desired hydrostatic test pressure as noted in the piping specification for a period of two full hours with no drop in pressure.

3. Pneumatic Test:
Insure that all valves are open (except stop valve at terminal equipment shall be closed). Pressurize the system with air or inert gas to the pressure noted in the pipe specifications. Maintain the test pressure for a period of twenty four (24) hours with no drop in pressure. Also apply soap solution to all joints and visually inspect for bubbles.

E. Hot Water, Chilled Water Piping:
1. Piping and Valves:
a. 2" and smaller (threaded and screwed joints)
Pipe:
Schedule 40, carbon steel, ASTM A53 or A106, butt welded, or seamless, ends threaded and coupled. Pipe shall be manufactured in the U.S. of domestically sourced materials.

Fittings:
150 pound class, black malleable iron, screwed, ASTM A47, ANSI B16.3 and B2.1

Unions:
150 pound class, black malleable iron, screwed, ground joints, bronze to iron seat, ANSI B2.1, ASTM A47

Thread Sealant:
Teflon Tape ½" wide x 3 mil thickness, Scotch brand or approved equal

Strainers:
250 pound S.W.P., screwed, cast iron body, "Y" pattern, 20 mesh perforated stainless steel screen: Crane, Muller

Ball Valves: (4" and smaller)
400 pound WOG, bronze, screwed ends, double TE seals and seat, full port, U.S. made: Jenkins Fig. 900-T, Crane, Hammond, Nibco, Stockham, Apollo, Milwaukee, Grinnell, Boston. Ball valves in insulated piping shall have 2" extended stem.

Globe Valves:
300 pound W.O.G., bronze screwed ends, composition disc, union bonnet, repackable under pressure, U.S. made: Hammond #IB413, Crane #7, Nibco #T-235Y, Stockham B-22, Milwaukee #590, Grinnell #3240, Apollo # 122T.

Check Valves:
125 pound S.W.P. bronze, screwed ends, screwed bonnet, swing check, U.S. made: Hammond #IB904, Crane #37, Nibco T-413B, Stockham #B-319, Milwaukee #509, Grinnell #3300, Apollo #161T.

2 ½" and larger (welded and flanged joints)

Pipe:
Schedule 40, carbon steel, ASTM 53 or A106 Grade A or B welded or seamless, ends beveled for welding. Pipe shall be manufactured in the U.S. of domestically sourced materials.

Fittings:
150 pound class, schedule 40, carbon steel, ends beveled for welding. All elbows shall be long radius (1.5D) unless noted otherwise on the drawings. ASTM A234, ANSI B16.9

Flanges:
150 pound class, forged steel, weld neck or slip-on, flat faced and drilled

Gaskets:
1/16" red rubber

Butterfly Valves: (Greater than 4")
150 pound WOG, fully lugged ductile iron body. Valves shall be bubble-tight shut-off, stainless steel or bronze disc, stainless steel stem, EPDMN seat, bronze bushing, worm gear operator on valves 8" and larger, latch-lock throttling handle with memory stop on valves 6" and smaller. Valves shall have 2" extended neck and stem for insulation. Valves shall be U.S. made: Demco, Jenkins, Crane, Muller, Nibco, Stockham, Hammond, Grinnell, Watts, Milwaukee, Victaulic 300 Masterseal, Conbraco/Apollo

Check Valve:
125 pound series, wafer (non-slam) design, iron body, bronze seat, disc and bushing stainless steel, U.S. made: Jenkins Fig. 777, Missions, Nibco Fig. W-910, Stockham Fig. WG-970, Hammond Fig. IR9253A, Grinnell Fig.300, Milwaukee, Victaulic-716

Strainers:
175 psi WOG, Y-pattern, cast iron body, flanged connection, bolted flanged covers with blow-off tapping, No. 20 mesh stainless steel wire screen or perforated metal. Mueller, Crane

b. At the Contractor's option, 2 ½" and larger steel pipe may be assembled with rigid Victaulic couplings (for above ground and below ground piping).

1. Victaulic couplings shall be self-centering and shall engage and lock in place grooved or shouldered pipe and pipe fitting ends in a positive watertight couple. Fittings shall have shift limiting and angular pad design for rigidity.

2. Couplings housing clamps shall consist of two or more malleable irons castings complying with ASTM A536. Housing clamps shall hold in place a composition

watersealing gasket designed so that internal water pressure serves to increase the seal's watertightness.

3. Couplings assembly shall be securely held together by two or more trackhead, square or oval neck, steel bolts, or by single locking pin. Bolts and nuts shall be heat threated carbon steel and shall be in accordance with ASTM A183.

4. All pipe fittings connected to mechanical pipe couplings shall be Victaulic (unless noted otherwise on the plans or specifications), and shall have groove or shouldered ends and shall be fabricated or malleable iron casting in accordance with ASTM A536 or ductile iron Grade 65-45-12 in accordance with ASTM A536. Victaulic #920 mechanical style tees shall be acceptable. All elbows shall be long radius (1.5D) unless noted otherwise on the drawings.

5. Before couplings are assembled, pipe ends and outsides or gaskets shall be lightly coated with Victaulic lubricant.

6. Pipe grooving shall be in accordance with Victaulic's specifications. Pipe may be cut-grooved or roll-grooved, except that pipe and tubing with wall thicknesses less than minimum recommended by manufacturer for cut-grooving shall be roll-grooved without removal of any metal.

7. Flanged connections shall be welded to a spool piece or shall be Gruvlok Model "F-3". Victaulic model 741 flange adapters are not acceptable.

8. Valves, strainers, and suction diffusers shall be provided in accordance with paragraph E.1. or as manufactured by Victualic.

9. Entire coupling installation shall be in accordance with Victaulic's latest published instructions. A factory trained representative from the manufacturer shall provide on-site training for contractor's field personnel in the use of grooving tools and installation of field joints.

10. All condenser water above and below ground piping and fittings shall be hot dipped galvanized.

11. Substitute manufacturer: Anvil, "Gruvlok".

c. At the Contractor's option, 2-1/2" pipe and smaller may be installed with copper pipe and fittings (sweat joint or press joint).

Piping and Valves:

a. 2" and smaller Pipe:
Type "L" copper tube, ASTM B88, with wrought copper fittings and soldered joints or press joints (Viega "Pro Press", Elkhart, Nibco).

Strainers:
250 pound S.W.P., screwed, bronze body, "Y" pattern, 20 mesh perforated stainless steel screen: Crane, Muller

Ball Valves: (4" and smaller)
400 pound WOG, bronze, screwed ends, double TE seals and seats, full port. Ball valves in insulated piping shall have 2" extended stem. U.S. made: Jenkins Fig. 900-T, Crane, Hammond, Nibco, Stockham, Apollo, Milwaukee, Grinnell

Globe Valves:
150 pound S.W.P., bronze screwed ends, composition disc, union bonnet, repackable under pressure, U.S. made: Hammond #IB413, Crane #T-235Y, Stockham B-22, Milwaukee #590, Grinnell #3240

Check Valve:
125 pound S.W.P., bronze screwed ends, screwed bonnet, swing check, U.S. made: Hammond IB904, Crane #37, Nibco T-413B, Stockham #B-319, Milwaukee #509, Grinnell #3300

Note: Provide a brass service valve between all copper/iron connections.

2. Testing:
   - Chilled Water:
     Test per paragraph D.2; Hydrostatic Test @ 150 psig. (prior to insulating pipe)

   - Hot Water:
     Test existing piping serving the A-wing, including new and existing piping per paragraph D.2; Hydrostatic Test @ 50 psig. (prior to insulating piping)

G. Natural Gas Piping:

1. Piping and Valves

Aboveground:

Pipe:
Schedule 40, wrought iron or steel pipe complying with ANSI Standard B36.10-1970, ASTM A-53 or A106

Inside Building Envelope:
2" and smaller: socket welded joints
2 ½" and larger: welded and/or flanged joints

Outside the Building:
2" and smaller: threaded and screwed joints
2 1/2" and above: welded and/or flanged joints

Fittings:
Screwed:
150 pound class, black malleable iron

Welded:
150 pound class, Schedule 40, steel, ends beveled for welding or socket fitting

Unions:
150 pound class, black malleable iron, screwed, ground joints, bronze to iron seat

Flanges:
150 pound class, forged steel, weld neck or slip on, flat faced and drilled, with gasket

Flexible Connectors:
300 series stainless steel corrugated hose with 304 stainless steel braided cover. UL listed and CSA/AGA certified. 175 working pressure at $70^0$F. Maximum 18" length. By Flex-Hose, Metraflex, Mason

Thread Sealant:
Teflon tape, ½" wide x 3 mil thickness, scotch brand or equal

Service Valve / Gas Cocks:
400 pound WOG, full port, bronze body, screwed end, rated for natural gas service, U.S. made: Crane, Hammond, Grinnell, Nibco, Stockham, Milwaukee, Apollo

Pressure Reducing Valves (or valve assemblies):
Shall comply with ANSI Z21.18 (appliance Reducing regulators) or ANSI Z21.80 (line regulators). Provide overpressure protection device (OPD) as required by ANSI Z21.18 Valves or ANSI A21.80. Where vents are required, pipe to the outside.
Pressure Reducing valves shall be sized for 1 psi inlet pressure for 2 psi meter systems or 1.5 psi inlet pressure for 5 psi meter systems.

2. Testing:
   Test per paragraph D.3 Pneumatic Test at 60 psig for 2 hours.

   Provide a letter to the engineer certifying that all gas pipe has been tested in accordance with the International Gas Code. The letter shall include date tested, pressure, duration, and witnesses.

3. Appliance Connections: At each appliance provide a 6" dirt leg, flexible connectors, strainer, service valve, pressure regulator (where required) over pressure protection device (where required) and test port downstream of regulator (where regulator required).

4. Painting: Paint all exposed gas piping per "PAINTING" section of these specifications.

H. Make-up Water:
1. Pipe shall be type "L" hard copper tube, ASTM B88, with wrought copper fittings jointed with solder.

2. Testing:
   Test per paragraph D.2: hydrostatic test at 150 psig.

I. Equipment Drains or Vents:
A/C Condensate: Aboveground: Unless noted otherwise on the plans, condensate drains shall be type "L" copper with wrought fittings and sweat or Pro Press joints (inside the building), or galvanized iron with threaded and screwed joints (on the roof).

Provide a brass/bronze union/nipple between all copper/iron/stainless connections.

Condensing Boiler Condensate:
PVC, Schedule 40. Pipe shall conform to ASTM D-2665 or D-1785, Standards and shall bear NSF seal of approval.

All Other Drains and Vents:
Type "L" copper with wrought fittings and sweat or process joints. Testing not required.

J. Insulation:
All cold surfaces shall be sufficiently insulated to prevent sweating.

All pipe insulation shall be installed by an independent insulating contractor.
Insulate only after leak testing. Install strictly per manufacturer's recommendations.

Pipes passing thru fire rated walls and partitions and floors shall be made fire proof. Refer to detail on drawings.

Suspended piping shall have insulation saddles and rigid insulation spaces at hangers. Refer to "Hangers and Supports" section of these specifications for requirements.

Insulation shall be installed with staggered longitudinal joints.

1. Hot Water Piping and Accessories above ground and concealed inside Building.

Insulate with high density fiberglass insulation with double self-sealing all-service vapor barrier jacket, ASTM C547.

Insulation shall have the following minimum physical properties:
Flame Spread/developed smoke – 25/50, ASTM E84
Thermal conductivity – k=0.27BTU-in/(h-F-ft$^2$), ASTM C545 @ 100$^0$ F. MEAN

Permeability – 0.02 Perm, ASTE E96, Procedure A
Density – 4.0 lb/cu.ft.
Temp use ratings – to 450$^0$F

Insulate all fittings with a fiberglass insert and cover with a Zeston or Speedline one piece PVC insulated fitting cover.

Insulate all valves, connections, etc., per good industrial practices. All raw edges shall be sealed with MI #550 Viac mastic or equal.

All butt joints shall be sealed with manufacturer's supplied tape strips with same finish cover as the insulation.

Manufacturers: Owens-Corning, Johns-Manville, Knauf, Certainteed

Application Thickness:
Hot Water:
1 ¼" & less – 1½" thick
1 ½" & larger – 2" thick
Manufacturers: Owens-Corning, Johns-Manville, Knauf, Certainteed

2. Chilled Water Piping & Accessories above ground:
Insulate with closed cell, UV resistant, polyisocyanurate rigid insulation. Insulation shall have the following minimum physical properties:

Flame Spread/developed smoke – 25/50, ASTM B84
Thermal conductivity – k=0.17BTU-in./(h-F-ft$^2$), ASTM C-518-91 (aged)

Permeability (wet cup) – 4.0 Perm-in., ASTE E96
Density – 2.0 lb/cu.ft.
Temp use ratings – 296$^0$F to+300$^0$F

Manufacturers: Hi Therm HT-300, ITW Trymer PIR

Application Thickness: 1"

All joints shall be sealed vapor tight with Childers CP-70 mastic. Insulation shall have a Saran 560 PVDC vapor barrier jacket with 25/50 ASME-84 fire rating, perm rating of 0.01 per ASTM-E96. Elbows shall be finished with UV resistant PVC covers.

Insulate all valves, connections and accessories per good industrial practices.

2a. Chilled Water Piping & Accessories above ground (at contractor's option for branch piping to terminal equipment, 1-1/4" diameter piping or less, located in a conditioned space):
Insulate with closed cell, UV resistant, elastomeric rubber based, flexible insulation.
Insulation shall have the following minimum physical properties:

Flame Spread/developed smoke – 25/50, ASTM B84
Thermal conductivity – k=0.282BTU-in./(h-F-ft$^2$), ASTM C177

Permeability (wet cup) – 0.10 Perm –in., ASTE E96
Density – 6.0 lb/cu.ft.
Temp use ratings – 220$^0$F- 40$^0$F (upper/lower)
Manufacturers:
Armstrong “Armaflex”, K-Flex, Aeroflex

Application Thickness: 1”

All joints shall be sealed vapor tight with manufacturer’s recommended glue.
Piping insulation in mechanical rooms shall be covered with 30 mil PVC covers and fittings.
Insulation cover and fitting shall be Johns Manville "Zeston 2000" Series or equal. Insulation cover and fittings to be secured/sealed with adhesive.

All steel surfaces with Armaflex covering shall be painted with a rust protective coating before insulation is applied.

- New piping shall be coated with Rust Oleum black protective enamel.
- Existing installed surfaces with surface rusting shall have all loose or flaking rust removed and two coats of POR-15 rust preventative coating applied. (needs research)

Insulate all valves, connections and accessories with self-adhering elastomeric tape or per good industrial practices.

2b. Chilled Water Piping & Accessories above ground (at contractor's option for valves, fittings, and surface irregularities):
Insulate with closed cell, UV resistant, elastomeric rubber based, flexible insulation. Elastomeric insulation shall overlap polyisocyanurate insulation by minimum 3".

Insulation shall have the following minimum physical properties:

Flame Spread/developed smoke – 25/50, ASTM B84
Thermal conductivity – k=0.282BTU-in./(h-F-ft$^2$), ASTM C177

Permeability (wet cup) – 0.10 Perm –in., ASTE E96
Density – 6.0 lb/cu.ft.

Temp use ratings – $220^0$F- $40^0$F (upper/lower)

Manufacturers:
Armstrong “Armaflex”, K-Flex, Aeroflex

Application Thickness:

- 1” (in conditioned spaces)
- 1-1/2” (in central plants, main mechanical rooms or any other unconditioned space)

All joints shall be sealed vapor tight with manufacturer’s recommended glue.
Piping insulation in mechanical rooms shall be covered with 30 mil PVC covers and fittings. Insulation cover and fitting shall be Johns Manville "Zeston 2000" Series or equal. Insulation cover and fittings to be secured/sealed with adhesive.

Insulation in mechanical rooms shall be coated with a white, high gloss painted finish, furnished by the insulation manufacturer. Paint shall be two coats of Armstrong WB.

All steel surfaces with Armaflex covering shall be painted with a rust protective coating before insulation is applied.

- New piping shall be coated with Rust Oleum black protective enamel.
- Existing installed surfaces with surface rusting shall have all loose or flaking rust removed and two coats of POR-15 rust preventative coating applied. (needs research)

Insulate all valves, connections and accessories per good industrial practices.

3. Makeup Water:
   Insulate with 1/2” thick rubber based closed cell, UV resistant, elastomeric foam.

   Insulation and covering shall have 25/50 flame spread and smoke developed ratings.

4. A/C Condensate Drains Above Grade and Inside the Building:
   Insulate with ½” thick rubber based closed cell, UV resistant, elastomeric foam.

   Insulation shall have 25/50 flame spread and smoke developed ratings.

   Manufacturers: Armstrong “Armaflex”, K-Flex, Aeroflex

5. Piping Exposed Inside the Buildings (including mechanical room):

   Fiberglass: In addition to the all service jacket, all piping shall be covered with a lightweight, .010” thickness smooth aluminum jacket and banded with aluminum straps 8” on center.

   At the contractor’s option, Knauf Redi-Klad 1000 factory applied, zero perm, with embossed aluminized jacket may be used in lieu of aluminum covering.

   Armaflex: Cover with 30 mil PVC covers and fittings. Insulation cover and fitting shall be Johns Manville "Zeston 2000" Series or equal. Insulation cover and fittings to be secured/sealed with adhesive.

6. Piping Exposed to the Weather:
   Insulate with either 2” of Pittsburgh Corning “Foamglass” rigid cellular glass, or 1½” rigid isocyanurate. Pipe and fittings shall be finished with "Saran 560" 6 mil, PVDC vapor retarder film. The pipe and vapor retarder shall be covered with a jacket of .010” thickness smooth lightweight

aluminum secured with aluminum bands 8" on center. All ells shall be finished with formed aluminum jackets or sunlight resistant PVC covers.

K. Pipe Freeze Protection: (for all water piping exposed to the outside or freezing weather)
Before insulating, heat trace all flooded piping with Chromalox SRL (or RayChem) self- regulating pipe heating tape at one foot of tape per foot of pipe. Heat tape output shall be automatically controlled in proportion to the pipe temperature. Install the tape before insulating.

Heat tape output shall be based on pipe diameter:

| Pipe Size | Heat Output |
|---|---|
| 3" and less | 3w/ft |
| 4" & 6" | 5w/ft |
| 8" thru 12" | 8w/ft |

Coordinate the heat tape junction box location with the electrical contractor.

L. Hanger and Supports:
All pipe shall be substantially supported to the building steel and/or structure. Provide hangers and insulation saddles as specified. Hangers for multiple pipes 3" and larger and run parallel shall be staggered on alternating joist and not suspended from the same joist.

Pipes racked against a wall or concrete pad shall be secured with 12 gauge, hot dipped, galvanized (outside) or plated (inside) superstrut and slide-in pipe clamps. Copper pipe shall have a rubber insert for isolation.

Piping on a roof shall have adjustable height, screw clamp, and supports with a roof pad base. See detail on drawings.

All suspended piping shall be hung with rods of the following sizes:

| | | |
|---|---|---|
| pipe | ½" thru 2" | -3/8" threaded rods |
| pipe | 2 ½" thru 4" | - ½" threaded rods |
| pipe | 5" and 6" | - ¾" threaded rods |
| pipe | 8" thru 12" | -7/8" threaded rods |

All insulated piping shall have sheet metal insulation saddles at each hanger. Minimum saddle arc shall be $120^0$. Minimum saddle lengths shall be as follows:
pipes up to 6": 8" length metal saddle (20 ga.)
pipes 8" to 12": 14" length metal saddle (16 ga.)

Insulated pipe shall have a full perimeter, 18" length of high density, 25/50 rated, 19 psi compressive strength, isocyanurate (or 25/50 rated, 80 psi compressive strength calcium silicate for hot water or steam systems) and sheet metal insulation saddle at each pipe hanger for pipes 1-1/2" and larger. Pipes less than 1-1/2" with elastomeric insulation shall have a 12" long insert, or full perimeter section of isocyanurate insulation, or premanufactured rigid insulated pipe support by the insulation manufacturer (Armacell Ecolight or equal by other insulation manufacturer).

1. Steel Pipe:
Maximum distance between supports for steel pipe shall be as follows:
Bar joist and I beam construction:

| pipe size | ¾" | 1" | 1-½" | 2" | 2-1/2" | 3" | 4"-6" | 8"-12" |
|---|---|---|---|---|---|---|---|---|
| max. spacing | 7' | 7' | 9' | 10' | 11' | 12' | 12' | 12' |

Steel pipe shall be suspended with Grinnell Fig. 260 clevis hangers, with sheet metal insulation saddles (where insulated). All insulated steel pipe shall have a section of rigid insulation at hangers as noted in the general section of "Hangers and Supports", regardless of size.

All vertical runs of piping shall be supported at each floor penetration with Fig. 241 riser clamps welded to pipe.

2. Copper Pipe:
   Maximum distance between supports for copper pipe shall be as follows:

| pipe size | 3/8" to ¾" | 1"to 1 ¼" | 1 1/2" to 2" | 2 1/2"to 3" |
|---|---|---|---|---|
| max. spacing | 5' | 6' | 8' | 10' |

   Copper piping shall be suspended with Grinnell Fig. #CT-69 hanger (uninsulated) and with insulation saddle when insulated.

3. Upper Attachments:
   All upper attachments shall be approved types. Submit manufacturer's literature on all attachments.

   Any upper attachments suspending pipe from a roof structure with a slope greater than 2 ft. per 12 ft. shall have a pivoting hanger, Michigan Model #320 bracket and Model #35 eye nut.

   Joist and beam attachments shall have a retaining strap to secure clamps against disengagement, Michigan Model 300-C.

   Hanger attachments to fire protected steel shall be mounted prior to spray application of the fire protection.

At contractor's option, pipe can be hung with cable suspension system utilizing cable kits with preassembled end fixings for attachment to structure, and adjustable cable lock fasteners. Cable support system shall meet all applicable SMACNA/ICC/MSS/UL/ASME requirements. Each application must be designed in conjunction with the manufacturer's representative and manufacturer's Territory Manager to provide the contractor with a job specific installation guide and system layout, which is then to be submitted to design engineer for approval. Cable and fastener must provide load capabilities with a minimum 5:1 safety factor, and be selected based on load calculations at each hanger. Fasteners must have height adjustment capabilities without the use of additional tools such as "declutchers." Manufacturer's Rep or Manufacturer's Territory Manager must be available for on-site training and inspections during installation.
Suspension system shall be manufactured by Gripple or prior approved manufacturer.

M. Pipe Installation:
1. Weld-o-lets shall be acceptable in lieu of tees where branch is two sizes smaller than main.

2. Install water piping with a constant elevation gradient so that it shall drain to low points. Install at each low point a drain valve with hose connection.

3. Provide all sensing wells and tappings necessary to accommodate the control system, and water treatment system. Coordinate with subcontractors.

4. Locate pipe with a minimum elevation above the floor at 7'0". Where space will not allow 7' minimum, coordinate elevation with the Engineer. Mount inline pumps no higher than 8'0" above the floor, for service access.

5. All pipe mounted indicating thermometers and gages shall be installed and adjusted to be read from floor level, without need for a ladder.

6. Earthquake Restraints: Refer to Seismic Restraint section of these specifications.

7. Unless indicated otherwise on the plans, all pipe trim (strainers, valves, unions, flow balancing devices, etc.) shall be the same size as the indicated pipe size.

N. Piping Specialties:

1. Air Vents: Install air vents at all high points of water piping systems. Air vents shall be ¼" brass cock with overflow tube piped to an accessible location. All vents shall be manual.

2. Calibrated Balancing Valves: Provide calibrated balancing valves or orifices where indicated on the drawings and at each terminal device. Valves shall have integral pointer to indicate degree of valve opening. Valve shall be rated for 125 psig working pressure, and brass body construction. Do not install with meter connections pointing downward. Bell & Gossett, Taco, Tour-Anderson, Nexus, Wheatly, Danfoss, IMI Flow Design.

3. Test Ports: Provide temperature and pressure sensing ports where indicated on the drawings. Test ports shall be brass construction, 3" length to extend past insulation (or l ½" in uninsulated pipe, with cap strap, EPDM Seal and NPT thread. SuperSeal by Flow Design or Petes Plug.

4. Flexible Coupling/Connectors:
   Air handling units:

   For pumps & equipment on spring isolated pads/rails. At each pipe connection 2" and larger, provide an arched reinforced resilient flexible connector of molded neoprene and nylon with integral cable restraints. Connectors shall be rated at 225 psi @ $240^0$F. Connectors shall have 150 psi ASA steel companion flanges.

   Specified: 2" and larger: Metraflex, "Cablesphere" (Metrasphere)
   Substitute: Mason, Keflex, Amber-Booth, Flex Hose

5. Flexible Connection Hoses:
   For terminal equipment branch pipe connectors 1½" and smaller, located inside the building. Hoses shall have reinforced rubber liner with braided stainless steel jacket, brass or bronze threaded couplings, and rated at 150 psi minimum. Hose shall be not more than one pipe size smaller than the branch piping, and/or not less than the equipment connection size. Maximum hose length shall be 24".

   Specified: Metraflex
   Substitute: Mason, Keflex, Amber-Booth, Flex Hose, Pro Hydronic Specialties, or by combination valve set manufacturer.

6. Combination Valve Sets:
   At the contractor's option, combination valve sets may be substituted for the specified pipe trim at each terminal unit (1¼" pipe size & less). The component valves shall meet or exceed the specification for each individual piece, as specified herein.

   Specified: Griswold
   Substitute: Auto Flow, Nexus, Wheatley, Hays, Pro Hydronic Specialties, Bell & Gossett, Victaulic, Tour & Andersson, IMI Flow Design, or by terminal unit manufacturer

P. Thermometers and Gauges:
Furnish and install thermometers and gauges where shown on the drawings.

1. Thermometers shall be 7" scale, adjustable angle, in black case, and red spirit filled tube.

   All thermometers shall be mounted in separable socket. 0 to 100 degrees F range chilled water, 30 to 240 degrees for hot water or hot and chilled water. Provide extended stem at insulated pipe. Trerice BX914, Weiss, Weksler, Miljoco, or Winters.

2. Pressure Gauges: Shall have 4-1/2" steel case, 0-60 psig range (unless noted otherwise). Trerice #600C with #865-1, 300 psi gauge cock, Weiss, Weksler, Miljoco, or Winters.

Q. Pipe Labels and Valve Tags:
Provide a durable color coded vinyl name tag for each pipe system. Coordinate color code with owner's code. In each mechanical room, the labels shall be a maximum of 25' on center; above ceilings, pipe labels shall be a maximum of 30' on center.

Provide a pipe label @ each main service valve.
Pipe shall be labeled as follows:
1. Hot Water Supply; Hot Water Return
2. Chilled Water Supply; Chilled Water Return
3. Natural Gas

Provide stamped or engraved tags for all valves, coded to the mechanical plans. Coordinate numbering system with owner.

R. Water Treatment:
Water treatment company shall provide the following services:
1. Provide chemical agents for the initial fill and cleaning of the piping systems, hot water and chilled water. Passivate the piping. Leave the system after start-up at proper Ph, corrosion and scale inhibited, and at the proper clarity. See "Pipe Flushing" section of the specifications; provide a letter certifying initial clean and treatment.

   Provide follow-up service calls as needed, but not less than quarterly, to maintain the hydronic system for one full year from date of substantial completion. Provide all required chemicals for the year.

   Chemical treatment contractor shall be Cascade Water Service. Coordinate with college the contact information for the specific technical/sales representee assigned to the Spartanburg Community College account.

DUCTWORK:
A. Shop Drawings: Submit shop drawings for all sheetmetal, accessories, and insulation.

B. Ductwork Installation and Protection:
Quality of the Work:
With the installation of all ductwork and all accessories, the fit and finish shall be in accordance with a high standard of skill and craftsmanship, and with established standards of the trades and shall be neatly mounted square and plumb to the building surfaces and structures.

Unless indicated otherwise on the plans, all ductwork and accessories shall be installed concealed in the walls or above ceilings.

All ductwork, whether installed or in storage, shall be protected from the rain and other elements. Ductwork shall be covered with a plastic membrane where there is the potential for wetting. All open ends of ductwork and fittings shall be sealed with plastic. Dunnage shall be provided to elevate ductwork in storage at least 3" above floor level.

C. Fabrication and Materials:

1. Sheet Metal Ductwork: All rigid ductwork shall be galvanized sheet metal of sizes as indicated on the drawings. Fabricate and install all ducts in accordance with “SMACNA Standards for Low Pressure Ductwork” 2” pressure class (unless noted otherwise), including type joints, gauge thickness, hanger supports and spacing, etc.

   Minimum sheet metal thickness shall be 26 gauge unless noted otherwise.

2. All branch duct connections to a trunk duct shall be made with prefabricated flared connections and as indicated on the drawings.

3. All rectangular duct 19” wide or larger and 2” pressure class or less shall be cross-broken or beaded for rigidity.

4. Fabricate fittings as shown on the drawings.

5. All duct dimensions given are net inside free area, ducts which require insulation liner shall be increased in size appropriately.

6. Install flexible connections at all air handling equipment and roof top units: including but not limited to, air handling units, blower coils, VAV terminals, roof or in-line exhaust fan**,** (supply and return). Connectors shall be metaledge VentGlas as manufactured by Ventfabrics, Inc. Connectors shall not contain asbestos.

7. All elbows (supply, return, exhaust and outside air) shall be constructed with either radius turns (throat and heel, centerline radius = 1.5 x duct width) or square with single thickness turning vanes. Vanes shall be constructed in accordance with ASHRAE design with 2” radius and 1.5” center-to-center dimension.

   Rectangular mitered elbows are acceptable for bends of $30^{o}$ or less in low pressure duct only.

8. For round low pressure duct work (1" or 2" pressure class), 12" diameter or less, 90 degree elbows shall be minimum 4 gore and minimum 1.0 centerline radius to duct diameter.

9. Field measure clearances and location for all duct pieces prior to fabrication.

10. Access doors shall be double thickness metal with internal 1” insulation, hinged doors with thumb latch. Minimum size shall be 14”x 14” unless duct size dictates smaller. Provide access doors for visual inspection at all inaccessible fire dampers and motorized dampers, whether or not indicated on the drawings.

11. Seal all duct joints with high bonding strength duct sealant. Duct sealant shall be rated per UL-181B-M. United McGill, Air Seal#33, Ductmate (water or solvent based), or Carlisle “Versa-Grip” #102.

12. “Ductmate” or similar bolted flange joining system shall be used (except duct located outside and fume exhaust) for all duct work with either duct dimension greater than 20”. At the contractor’s option, duct smaller than 20” shall be either SMACNA or “Ductmate”.

13. All dampers in ductwork with external insulation wrap shall have a stand-off bracket at the operating lever to match insulation thickness.

14 Flag all balancing dampers with tag of fluorescent tape for easy identification by the Test & Balance contractor.

15. Earthquake Restraints: Refer to Seismic Restraint Section of these specifications.

16. Flexible Ductwork: Where flexible duct connectors are indicated on the plans, the maximum length of flexible duct shall not exceed 5' in length. Provide a pre-manufactured radius forming durable elbow support (Titus FlexRight) where flexible ductwork is used as an elbow,

17. At contractor's option, duct can be hung with cable suspension system utilizing cable kits with preassembled end fixings for attachment to structure, and adjustable cable lock fasteners. Cable support system shall meet all applicable SMACNA/ICC/MSS/UL/ASME requirements. Each application must be designed in conjunction with the manufacturer's representative and manufacturer's Territory Manager to provide the contractor with a job specific installation guide and system layout, which is then to be submitted to design engineer for approval. Cable and fastener must provide load capabilities with a minimum 5:1 safety factor, and be selected based on load calculations at each hanger. Fasteners must have height adjustment capabilities without the use of additional tools such as "declutchers." Manufacturer's Rep or Manufacturer's Territory Manager must be available for on-site training and inspections during installation.

    Suspension system shall be manufactured by Gripple or prior approved manufacturer.

D. Duct Construction Standards:
1. High Pressure (6" Pressure Class): Discharge air from air handling unit RTU-A shall be 6" w.c. pressure class.

2. Low Pressure (2" Pressure Class): All ductwork; supply, return, exhaust, and outdoor air, unless noted otherwise.

3. Low Pressure round duct larger than 14" diameter shall be spiral fabricated. All high pressure round duct shall be spiral fabricated.

E. Flexible Duct (Supply ductwork only):
1. Low Pressure:

| | |
|---|---|
| Type: | Metal Helix with aluminized laminated fabric, UL-181 Class I listed, rated at 6"W.G. positive working pressure, 4000 FPM. |
| Fitting Connections: | Tape and Stainless steel screw clamps or Panduit heavy duty nylon cinch straps (25/50 fire/smoke rated). |
| Insulation: | 1" thick, 1 lb. density glass fiber (R=4) with metalized mylar seamless vapor barrier jacket. |
| Branch Connectors: | Spin-in conical tap |
| Specified: | Flexmaster Type 5M |
| Substitute: | Thermaflex, Hart & Cooley |

2. High Pressure: Supply air duct upstream of VAV terminals

   Type: Spiral wound aluminum, UL-181 Class 1 listed, rated to 10" W.G. positive pressure, 5500 FPM.

   Fitting Connections: Minimum three (3) sheet metal screws, tape, stainless steel bands and duct sealant.

   Insulation: 1" thick, l lb. density glass fabric with metalized mylar seamless vapor barrier jacket

   Branch Connector: Spin-in conical tap

   Specified: Flexmaster Triplelock Aluminum
   Substitute: Clevaform S-Series

F. Spiral Metal Duct:

All high pressure round, all round duct over 14" diameter, and elsewhere as noted on the drawings, all oval supply duct, and elsewhere as indicated on the drawings shall be spiral lock seam fabricated of ASTM-A653/A527 galvanized sheet metal, with G-90 coating, of the following minimum dimensions, unless noted otherwise:

| Diameter | Std.Pipe Gauge | Ribbed Pipe Gauge |
|---|---|---|
| 3-14" | 26 | 26 |
| 15-26" | 24 | 26 |
| 27-36" | 22 | 26 |
| 37-50" | 20 | 24 |

All fittings shall be factory fabricated of galvanized steel with spot weld and bonded seams. Gauge as follows: 3"-14"/24 ga, 15"-26"/22 ga, 27"-50"/20 ga, 52"-60"/18 ga. For ribbed construction fittings weight may be one gauge lighter. Elbows shall be 1 ½ duct diameter radius, 5 piece gore above 12" and die stamped 12" or less.

Suspended exposed duct shall have a circular band iron hanger with a threaded rod at the centerline of the duct. See SMACNA Manual for strap rod sizes.

Access doors shall be Type ARZ-W with insulated door as manufactured by United Sheet Metal or equal. All branch connectors shall have a conical tee fitting, a conical tap fitting, or a $45^0$ lateral take-off

Duct sections and fittings shall be connected as follows:

1) Standard:
   i. Metal slip joint couplings with duct sealant and sheet metal screws (standard).

   ii. At the contractor's option, ductwork with a diameter less than 24" diameter may be gasketed joints, such as Lindab "Spirosafe".

Specified: United Sheet Metal Acoust
United Sheet Metal (single wall)
Substitute: Monroe Metal, Semco, Texas, Hamlin, Lindab, Eastern Sheetmetal, TDS, EHG, SMI Fabrication, All-Type Sheet Metal

G. Sound Treatment:

1. Interior:

Ductwork Sound Treatment: Where indicated on the floor plans, wrap the duct with 1 lb. per sq. ft. cadium/vinyl lagging material and acoustical covering at the area wrapped. The acoustical wrap

shall be installed over 2" thick mineral wool insulation board/batts. Reduce the duct hanger spacing by ½ (double the hangers). (At contractor's option, a sound lagging with integral quilted 2" fiberglass sound absorber may be used in lieu of separate lagging and insulation.)
Refer to manufacturer's recommendations for installation materials and methods. At a minimum, sound treatment wrap shall be secured to ductwork with spotter pins or impact pins (GripNail). In addition to the pins, wrap shall be secured to ductwork with metal banding.Sound treatment wrap shall extend up to and include sound attenuators (if attenuators are indicated on the floor plans)
Lagging shall be Kinetics model KNM-100ALQ or equal by Sound Seal or BRD Noise Control

3. Flexible Branch Duct Connectors: Where flexible duct connectors are indicated on the plans, the maximum length of flexible duct shall not exceed 5' in length.

H. Insulation:
1. Install insulation per manufacturer's recommendation. Insulation liner shall be installed by the HVAC Contractor. Any exterior wrap and rigid board insulation shall be installed by an independent insulation contractor.

All ductwork and accessories handling air below $65^0$F or located in an area exposed to outdoor temperatures shall be sufficiently insulated to prevent sweating and/or meet energy codes.

2. Ductwork Liner (elastomeric foam):
Insulation shall be 1" thick, 3 PCF density, flexible acoustical and thermal duct liner. Liner shall have a smooth, scuff and abrasion resistant air-side surface, suitable for duct velocities to 8000 FPM. The liner shall have an antimicrobial treatment so that it will not support the growth of fungus or bacteria (in accordance with ASTM C1338/G21, G22, and UL181). Insulation liner and accessories shall meet all NFPA 90A requirements for duct liner and shall meet the requirements of UL 181 Erosion Test. Liner shall have a minimum "R" value = 4.0 for 1" thickness per ASTM C177 or C518. Burn characteristics shall meet 25/50 (flame/smoke) ratings per ASTM-E84. NRC rating shall equal .55 @ 1" thickness, per ASTM C 423-81 & E795. Minimum temperature rating shall be $180^0$F, per ASTM-C411.

Liner shall be secured with spotter pins or impact pins (GripNail) and 100% adhesive coverage. Adhesive shall be approved by manufacturer and applied per manufacturer instructions. Where welding pins are used, adjust amperage according to the manufacturer's specifications to prevent burning/melting of the liner and to reduce smoke generation while maintaining acceptable weld integrity.

Specified: Armacell AP "Coilflex" Duct Liner or Armacell AP "Armaflex" Duct Liner
Substitute: K-Flex, or by prior approved equal

3. Exterior Duct Wrap:
Ductwork shall be insulated with R=5.0 (installed), 2" thick, ¾ pcf, flexible, ASTM C1290 fiberglass duct wrap with a factory laminated reinforced scrim kraft foil vapor barrier facing. Insulation shall be secured with seams stapled with flare door type staples (6" o.c.) and sealed with two coats of Childers CP-30/34 mastic (or equal by Design Polymerics or by prior approved) and with an intermediate layer of open weave glass fabric. On ducts over 24 inches wide, additionally secure the insulation on the duct bottom with welding pins and push-on washers, 16 o.c. Duct wrap shall be UL listed and not exceed flame spread (25) and smoke developed (50) per ASTM E84. Duct shall have "Out of Package" R valve equal to 6.1. Insulation shall be manufactured by Owens Corning, Certainteed, Knauf, or Manville.

4. Application (Duct):
a. RTU-A: Rectangular Supply and Return ductwork shall have 1" thick, 3 PCF elastomeric foam liner as for the first 20 linear ft. The remainder of the rectangular supply duct shall have

wrap. The remainder of the return shall not require insulation. All round and oval supply ductwork shall be insulated with exterior wrap.

b. VAV Terminals: Unless noted otherwise, Rectangular supply and return air ductwork and plenums for all units shall have 1" thick, 3 PCF density elastomeric foam duct liner for the first 10 linear ft. The remainder of the rectangular, round, and oval supply duct shall have exterior fiberglass wrap. The remainder of the return shall not require insulation In occupied spaces without ceilings or having partial ceilings.
c. All transfer ducts shall have elastomeric foam liner, 1" thick x 3 PCF.
d. Exhaust duct shall not require insulation.
e. Flexible duct shall be factory insulated.
f. Fresh air ductwork, including outdoor air units, and boiler/water heater intakes, shall have exterior flexible wrap, 2" thick.

I. Testing:

All high pressure ductwork shall be leak tested High pressure supply air duct thru the terminal branch duct tap and to the flexible duct connection shall be leak tested in accordance with the SMACNA High Pressure Duct Construction Standards, latest edition.

Total duct leakage shall not exceed 1% of the individual system design air flow at 3" WG pressure. Duct pressure testing shall be performed on the following units:

- RTU-A

The test apparatus and test execution shall be furnished by an independent test and balance contractor as noted in the Test & Balance section of these specifications. All preliminary test procedures, i.e., insuring duct tightness and capping all terminals, branches, and open duct sections, shall be the responsibility of the HVAC contractor. Test shall be completed with all branch ducts in place, up to the VAV terminal flex duct connection.

A copy of the leakage test report, signed by the test and balance contractor shall be included with the test and balance report required by Test & Balance Section of these specifications.

MOTORS:

Unless otherwise noted, all motors shall be 40 degrees C rise, dripproof, minimum 1.15 service factor. All motors shall have overload protection.

All motors served by a variable speed drive shall be rated for variable speed service. Motors shall have motor shaft grounding protection.

Electronic Commutated Motors (ECM):

Motor shall be a brush-less DC, electronic commutation (EC) motor specifically designed for fan applications. Motors shall be permanently lubricated with heavy-duty ball bearings to match the fan load and pre-wired to the specific voltage and phase. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled as noted in the control specifications. Motor shall have internal overload protection.

MOTOR STARTERS:

A. Standard:

Provide motor starters where indicated on the equipment schedule and in the equipment specifications.

All starters shall be complete with overload protection for each line. Each starter shall be equipped with a selector switch marked "ON"-"OFF"-"AUTO". Each motor starter shall have a control circuit transformer and holding coil. Coordinate the control voltage with controls contractor. Auxiliary

contacts shall be furnished as required to fulfill the control sequence. Control transformers shall be rated at 100VA (minimum) to power the holding coil and controls.

Indoor mounted starters shall have NEMA I enclosures, outdoor mounted starters shall be NEMA 3R.

Each motor starter shall have a nameplate indicating its associated equipment and equipment no. (i.e., hot and chilled water pump). Each tag shall be black laminated phenolic plastic with engraved letters and shall be secured with screws (not glue).

Specified: Square D
Substitute: GE, Siemens, Cutler Hammer, Sprecher/Schuh

B. Variable Speed Drives:
Provide pulse width modulated, adjustable frequency drive which generates a sine-coded, adjustable voltage/frequency, three phase output for speed control of any conventional squirrel cage induction motor. The drive shall maintain a power factor of not less than .95 throughout its speed range.

1. Design Features shall include:
   a. Sine-coded, pulse width modulated output
   b. 16-bit microprocessor control logic
   c. Overload capability of 110% for 60 seconds
   d. Coast or ramp to stop
   e. Adjustable acceleration and deceleration
   f. Run and fault LEDS
   g. Run and fault contacts for customer use
   h. Controlled speed range of 10:1
   i. Process follower input: 4-20MA or 10VDC
   j. Touch pad operator controls with five digit digital frequency/speed meter
   k. Critical frequency rejection circuit
   l. Slip compensation
   m. Torque limiting circuit
   n. NEMA 1 enclosure (indoor) or NEMA 3R/FVFF (forced ventilated, fan filtered), outdoor.
   o. 5% Input A/C line reactors
   p. Speed pot for manual speed adjustments
   q. Communications board (Lon, BacNet, etc. as required to match the Building Management system vendor for data reports to the Building Management system.
   r. Output carrier frequency programmable @ 0.5,1,2,4, or 8 KHZ and randomly modulated about the selected frequency
   s. Power factor not less than .98 lagging @ any load

2. Protective Features shall include:
   a. Current limited stall prevention during acceleration, deceleration and run conditions
   b. Automatic restart after momentary power loss
   c. Start into a rotating motor with speed search
   d. Diagnostic circuit display
   e. DC bus CHARGE readout
   f. Isolated operators controls
   g. Phase to phase short circuit protection
   h. Ground fault protection
   i. Electronic thermal motor overload
   j. Anti-windmill protection with DC injection before start
   k. Heat sink over temperature protection

3. Adjustment shall include:
   a. Acceleration: 0.1 to 1800 seconds
   b. Deceleration: 0.1 to 1800 seconds
   c. Maximum frequency of up to 60 HZ +/- 10% via touch pad
   d. Critical frequency rejection
   e. Minimum frequency
   f. Maximum frequency
   g. Carrier frequency
   h. Torque limit
   i. Slip compensation
   j. DC injection braking time
   k. DC injection braking amplitude
   l. Multi-step speed settings, 5 maximum

4. Environmental and Service Conditions shall be suitable for:
   a. Ambient service temperature: 10 degrees to 40 degrees C
   b. Humidity to 90%
   c. Service factor of 1.0

5. Starter shall be:
   a. ETL or UL listed

6. Starter Options shall include:
   a. H-O-A Switch
   b. Ammeter
   c. Line Bypass with Magnetic Contactors and overload protection where indicated on the equipment schedule.

7. Provide a variable speed starter where indicated on the equipment schedule:

8. Drives shall have the following points addressable from the Building Management System:
   Motor Frequency
   a. Motor Frequency Read
   b. Motor Current
   c. Acceleration time
   d. Deceleration time
   e. Motor Rated Voltage
   f. Motor Rated Amperag
   g. Motor KW
   h. Drive Run
   i. Drive Status
   j. Alarms
   k. Alarm-Faults: Clear All
   l. Alarm-Faults: Notification

The drive shall carry a two (2) year “on site” warranty.

The starter shall be tested with fully loaded induction motors. The combined test data shall be analyzed to insure adherence to quality assurance specifications.

The adjustable frequency drive shall be sized for the motor horsepower and voltage as scheduled on the drawings.

Provide factory assisted start-up and check-out services. Set drives for a minimum speed of 25%.

Provide output line reactors when the distance between the drive and the motor exceeds 150 ft.

Outdoor starters shall not be mounted in direct sunlight. Provide stainless steel sun shield as required.

Factory OEM Drives:
Variable frequency drives provided and installed by the manufacturer shall meet all features, adjustments, and safeties listed above.

Independent Drives (provided separate from equipment). All drives for the HVAC equipment shall be one manufacturer.

Specified: ABB
Substitute: By prior approval

ANCHOR BOLTS:
Provide anchor bolts for all concrete slab mounted equipment. Bolts shall be of suitable type for load and purpose and shall be accurately spaced. See "Wind and Seismic Restraints" section of these specifications for equipment requiring seismic restraints.

VIBRATION ISOLATION:
A. Pipe Flexible Connectors: (see “Piping Specialties” section of these specifications).

B. Fan Powered VAV Boxes:
All VAV terminals and in line fan hangers shall be isolated with steel springs located in a neoprene cup and housed in a steel bracket. The hanger shall allow 30 degrees misalignment before the rod contacts the hanger box. Minimum deflection shall be 0.75”, (4) per unit. Mount hangers to structure (highest point).

Specified: Mason # 30N
Substitute: Vibration Mountings, Amber Booth, Vibration Elimination, Kinetics Noise Control, Vibro-Acoustics, Caldyn

EQUIPMENT:
A. General
1. Utility Rebate Accounting:
In order to facilitate the Owner’s utility rebate applications, the Contractor shall provide itemized accounting of qualifying equipment. The information shall include individual equipment model numbers, and cost per unit (dollars). The equipment requiring this information shall include the following:
1) ECM Motors
2) Variable Frequency Drives (VFD’s)

2. Submit shop drawings on all equipment listed in this section of the specifications.

3. Extra Filters: For all equipment requiring air filters, the owner shall be furnished one set of filters. The owner’s extra set of filters shall be in addition to the filters in place at the date of substantial completion. The mounted filters shall be clean at the date of substantial completion. (If equipment is operated during the construction phase of the project, the construction phase filters shall be replaced as needed to maintain clean coils and equipment). Filters during construction shall be rated MERV 8 at occupancy.

4. Air Handling System Fan Drive Modification:
   Provide all necessary fan sheave changes and/or pulley adjustments as required to comply with the Test and Balance section of these specifications.

5. Equipment and Access Tags: Provide an engraved phenolic nametag with 1" high letters for each piece of equipment scheduled on the HVAC plans (excluding air devices). The tag shall be labeled to match the equipment schedule tag i.e. AC-1, AHU-1, EF-1, etc. The tag shall also include the unit model, and the unit serial number. The tag shall be secured to the equipment with screws or chains and at an easily visible location. For equipment exposed in finished areas, install tag inside unit cabinet.

   Where filters, fans, or water coils are located above a ceiling, secure a marker tag with ¼" high letters stating the unit's tag i.e. "T-37", "FILTER", "FAN", and/or "WATER COIL" to the ceiling grid indicating the ceiling tile to be removed for best access.

   Secure a marker tag with ¼" high letters on each VAV box control panel indicating DDC address.

6. Integration with Building Management System:
   Where HVAC equipment is provided with its own BACnet factory controller, shop drawings shall include BACnet device number and BACnet object information. Equipment vendor shall be responsible for meeting the 'Sequence of Operations' specified under the Control Section of this specification and/or as shown on the drawings (if controller is factory installed). The equipment vendor and controls contractor shall coordinate to ensure that the sequence of operations is fully executed.

7. Demonstration Unit:
   Where there are multiple occurrences of terminal equipment, complete installation of one demonstration unit (including piping, pipe components, ductwork, hangers, etc.) prior to commencing work on additional units. Notify engineer when ready for inspection. Such terminal equipment includes fan coils, unit ventilators, blower coils, water source heat pumps, VAV boxes, etc.

8. Factory Startup:
   Factory service technicians shall initiate the operation of certain equipment, and those startup reports shall be included in the closeout documents. See individual equipment specifications for further information. Factory technicians shall coordinate with the controls contractor to confirm the correct points are implemented in the BCS, according to the sequence of operations (see HVAC Controls section).

   In addition to start-up services, a factory-trained and authorized technician shall meet on-site with the HVAC controls contractor after the controls system is substantially completed to coordinate the interface with the factory controllers and verify the sequence of operations.

   Equipment requiring factory start up includes (but is not limited to) the following:
   1. Boilers
   2. Variable frequency drives
   3. RTU-A

   Refer to the equipment specification section for additional factory startup requirements.

B. Air Handling Units
   Air handling units shall be cETLus safety listed. Unit shall be certified in accordance with the central station air handling unit's certification program, which is based on AHRI Standard 430. Air handling unit water heating & cooling coils shall be certified in accordance with the forced circulation air cooling

and air heating coils certification program, which is based on AHRI Standard 410. Unit shall conform to AHRI 410 and 430 Standards.

Acoustics: Sound power levels (dB) for the unit shall not exceed the specified levels shown on the unit schedule. The manufacturer shall provide the necessary sound treatment to meet these levels if required.

UNIT CONSTRUCTION:
Unit shall be fabricated unit with heavy gauge channel posts and panels secured with mechanical fasteners. All panels, access doors, and ship sections shall be sealed with permanently applied bulb-type gasket.

Panels and access doors shall be constructed as a 2-inch nominal thick; thermal broke double wall assembly, injected with foam insulation with an R-value of not less than R-13. Exterior surfaces shall be constructed of painted galvanized steel, for aesthetics and long-term durability. Paint finish will include a base primer with a high-quality polyester resin topcoat. Finished, unabraded panel surfaces shall be exposed to an ASTM B117 salt spray environment and exhibit no visible red rust at a minimum of 3,000 hours exposure. Finished, abraded surfaces shall be tested per ASTM D1654, having a mean scribe creepage not exceeding 1/16” at 1,000 hours minimum exposure to an ASTM B117 salt spray environment. Measurements of results shall be quantified using ASTM D1654 in conjunction with ASTM D610 and ASTM D714 to evaluate blister and rust ratings.

The inner liner shall be constructed of G90 galvanized steel. The floor plate shall be constructed as specified for the inner liner. Unit will be furnished with solid inner liners, except the fan section, fan section access doors shall be perforated for sound attenuation.

Panel deflection shall not exceed L/240 ratio at 125% of design static pressure, maximum 5 inches of positive or 6 inches of negative static pressure. Deflection shall be measured at the panel midpoint.

The casing leakage rate shall not exceed 0.50 cfm per square foot of casing surface area at design static pressure up to a maximum of +5” w.c. in positive pressure sections and -6” w.c. in negative pressure sections.

Module to module field assembly shall be accomplished with an overlapping, full perimeter internal splice joint that is sealed with bulb type gasketing on both mating modules to minimize on-site labor and meet indoor air quality standards.

Access doors shall be flush mounted to cabinetry, with minimum of two six inch long stainless steel piano-type hinges, latch and full size handle assembly. Access doors shall swing outward for unit sections under negative pressure. Access doors on positive pressure sections, shall have a secondary latch to relieve pressure and prevent injury upon access.

Provide cross broke roofcap system to divert water from the top surface of the air handler. The rain shed roofcap shall have 2”standing seams covered with splice cap channels to seal top seam. Splice cap shall break down over sides of standing seam to protect the ends of the seam.

Cooling coil piping vestibule 30” deep shall be factory installed of standard cabinet construction on the coil connection side of the unit. Roofcap over vestibule shall be a continuous single piece covering both the coil section and the vestibule. Roofcap seams between coil section and vestibule are not allowed.

Heating coil piping vestibule 30” deep shall be factory installed of standard cabinet construction on the coil connection side of the unit. Roofcap over vestibule shall be a continuous single piece

covering both the coil section and the vestibule. Roofcap seams between coil section and vestibule are not allowed.

The unit shall have a 6-inch curb ready base for structural rigidity and condensate trapping. The curb-ready base shall be designed with sloped drip pans located under all unit sections except duct openings and shall be supported by frame member. Wind rated roof curb shall be provided with the unit.

An insulated, double-walled piping vestibule, 30" deep, shall be factory installed of standard cabinet construction on the coil connection side of the unit. Roofcap over vestibule shall be a continuous single piece covering both the coil section and the vestibule.

Construct drain pans from stainless steel with cross break and double sloping pitch to drain connection. Provide drain pans under cooling coil section. Drain connection centerline shall be a minimum of 3'' above the base rail to aid in proper condensate trapping. Drain connections that protrude from the base rail are not acceptable. Insulation under drain pans hall be minimum 2'' thickness.

FAN ASSEMBLIES:
Fan assembly shall be a single width, single inlet, class II, direct-drive type plenum fan dynamically balanced as an assembly, as shown in schedule. Maximum fan RPM shall be below first critical fan speed. Fan assemblies shall be dynamically balanced by the manufacturer on all three planes. Provide access to motor and fan assembly through hinged access door.

Fan and motor shall be mounted internally on a steel base. Factory mount motor on slide base that can be slid out the side of the unit if removal is required. Provide access to motor, drive, and bearings through hinged access door. Fan and motor assembly shall be mounted on 2" deflection spring vibration type isolators inside cabinetry.

BEARINGS, SHAFTS, AND DRIVES:
Bearings: Basic load rating computed in accordance with AFBMA - ANSI Standards. The bearings shall be provided on the motor with the fan wheel mounted directly on the motor shaft, AMCA arrangement 4. Shafts shall be solid, hot rolled steel, ground and polished, keyed to shaft, and protectively coated with lubricating oil. The fan wheel shall be direct coupled to the motor shaft. The wheel width shall be determined by motor speed and fan performance characteristics.

ELECTRICAL:
The air handler(s) shall be ETL and ETL-Canada listed by Intertek Testing Services, Inc.
Fan motors shall be manufacturer provided and installed, Open Drip Proof, premium efficiency (meets or exceeds EPAct requirements.) Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclosed terminal lugs in terminal box sized to NFPA 70.
Manufacturer shall provide ASHRAE 90.1 Energy Efficiency equation details for individual equipment to assist Building Engineer for calculating system compliance. Air handler manufacturer shall provide, mount and wire ABB variable speed drive with electrical characteristics such as indicated on project schedule and shown on manufacturer's data sheets.

COOLING COILS:
Water cooling, water heating, steam, and refrigerant coils shall be certified in accordance with AHRI Standard 410 and bear the AHRI label. Coils exceeding the scope of the manufacturer's certification and/or the range of AHRI's standard rating conditions will be considered provided the manufacturer is a current member of the AHRI Forced Circulation Air-Cooling and Air-Heating Coils certification programs and that the coils have been rated in accordance with AHRI Standard 410. Manufacturer must be ISO 9002 certified.

Provide access to coil(s) for service and cleaning. Enclose coil headers and return bends fully within unit casing. Unit shall be provided with coil connections that extend a minimum of 5" beyond unit casing for ease of installation. Drain and vent connections shall be provided exterior to unit casing.

Coil connections must be factory sealed with grommets on interior and exterior panel liners to minimize air leakage and condensation inside panel assembly. Coils shall be removable through side and/or top panels of unit without the need to remove and disassemble the entire section from the unit. Headers shall consist of seamless copper tubing to assure compatibility with primary surface. Headers to have intruded tube holes to provide maximum brazing surface for tube to header joint, strength, and inherent flexibility. Header diameter should vary with fluid flow requirements.

Fins shall have a minimum thickness of 0.0075 inch aluminum plate construction. Fins shall have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Tubes shall be mechanically expanded into the fins to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates. Bare copper tubes shall not be visible between fins. Coil tubes shall be OD seamless copper, 0.020 inch nominal tube wall thickness, expanded into fins, brazed at joints.

Coil connections shall be carbon steel, NPT threaded connection. Vent and drain fittings shall be furnished on the connections, exterior to the air handler. Vent connections provided at the highest point to assure proper venting. Drain connections shall be provided at the lowest point to insure complete drainage and prevent freeze-up. Coil casing shall be a formed channel frame of stainless steel.

HEATING COILS:
Provide access to coil(s) for service and cleaning. Enclose coil headers and return bends fully within unit casing. Unit shall be provided with coil connections that extend a minimum of 5" beyond unit casing for ease of installation. Drain and vent connections shall be provided exterior to unit casing. Coil connections must be factory sealed with grommets on interior and exterior panel liners to minimize air leakage and condensation inside panel assembly. If not factory packaged, Contractor must supply all coil connection grommets and sleeves. Coils shall be removable through side and/or top panels of unit without the need to remove and disassemble the entire section from the unit.

Headers shall consist of seamless copper tubing to assure compatibility with primary surface. Headers to have intruded tube holes to provide maximum brazing surface for tube to header joint, strength, and inherent flexibility. Header diameter should vary with fluid flow requirements.
Fins shall have a minimum thickness of 0.0075 inch aluminum plate construction. Fins shall have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Tubes shall be mechanically expanded into the fins to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates. Bare copper tubes shall not be visible between fins. Coil tubes shall be 5/8 inch OD seamless copper, 0.020 inch nominal tube wall thickness, expanded into fins, brazed at joints.

Coil connections shall be carbon steel, threaded connection. Vent and drain fittings shall be furnished on the connections, exterior to the air handler. Vent connections provided at the highest point to assure proper venting. Drain connections shall be provided at the lowest point to insure complete drainage and prevent freeze-up.
Heating coil shall be furnished as an uncased galvanized steel to allow for thermal movement and slide into a pitched track for fluid drainage.

FILTERS:
Furnish flat panel filter section with 4-inch pleated MERV 8 filter. Provide side loading and removal of filters. Filter media shall be UL 900 listed, Class I or Class II.

ECONOMIZER:
Economizer section shall be provided with left side outside air opening and end return air opening and right side exhaust air opening with or without parallel low leak airfoil damper blades. Dampers shall be hollow core galvanized steel airfoil blades, fully gasketed and have continuous vinyl seals between damper blades in a galvanized steel frame. Dampers shall have stainless steel jamb seals along end of dampers. Linkage and ABS plastic end caps shall be provided when return and outside air dampers sized for full airflow. Return and outside air dampers of different sizes or very large dampers and exhaust dampers must be driven separately. Damper Leakage: Leakage rate shall be less than two tenths of one percent leakage at 2 inches static pressure differential. Leakage rate tested in accordance with AMCA Standard 500.

Specified: Daikin “Skyline”
Substitute: JCI, Carrier, Trane

C. Exhaust Fans:
Fans shall have capacity as noted on the drawings.

Each fan shall be provided with accessories as noted in the schedule.

Roof curbs shall be insulated, 12” high, galvanized, all welded, with integral cant, and manufactured by the fan manufacturer.

Fans serving cooking appliances shall have UL762 rating, hinged curb base cap and shall have extended curbs as required to conform to NFPA96.

Each belt drive fan shall have adjustable sheeves, ball bearings and belt guard (where exposed). Drives shall be sized for 150% minimum of driven horsepower. Bearings shall be regreasable pillow block type with cast iron housing with minimum life (L50) in excess of 200,000 hours.

Fan wheels shall be balanced in accord with AMCA 204-96 std.

Birdscreens shall be ½” galvanized wiremesh.

All motors served by a variable speed drive shall have motor shaft grounding protection.

Each roof fan shall be secured to its curbs with two lag screws, 2’o.c., but not less than 2 per each side.

EC Motors (ECM): Where indicated on the schedule, motors shall be DC electronic commutation type motor. Motors shall be permanently lubricated with heavy duty ball bearings to match the fan load and pre-wired to the specific voltage and phase. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controlable down to 20% of full speed. Speed shall be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VDC signal. Motor shall be minimum of 85% efficient at all speeds.

Specified Fans: Greenheck
Substitute: Penn, Cook, Jenn Air, Briedert, ILG, Acme, Carnes, Twin City, Ventco

D. Air Diffusers and Grilles:
Air devices shall be as scheduled on the drawings. All such devices shall have baked-on white finish unless noted otherwise.

Coordinate location of each ceiling device with the architectural reflected ceiling plans.

Each ceiling diffuser shall have hinged or removable face.

Type blow shall be four-way unless indicated otherwise on the floor plans.

Each ceiling diffuser or grille mounted in a ceiling tile in a lay-in grid system shall be supported by the metal grid with steel sheet metal angles secured to the diffuser or grille neck and spanning from grid to grid.

Filter grilles shall be hinged with ¼ turn fasteners, and accept 2" thick filters.

Low sidewall return grilles shall have horizontal blades, unless noted otherwise.
Submit sample of heavy-duty return air grille for owner/engineer's review. Sample grille shall be 24"x24".

For all high sidewall returns, grille shall be oriented to minimize line-of-sight visibility between the occupied space and the ceiling space.

Surface mount air devices shall have countersunk screw holes. Fasteners shall be flush and match the finish of the air device flange.

Specified: Price
Substitute: Titus, Krueger, Metalair, J & J Register, Carnes, Nailor, Tuttle & Bailey, Greenheck

E. Louvers:
Refer to drawings for louver sizes. Louvers 2' high or smaller shall be 4" deep. Louvers higher than 2' shall be 6" deep. All louvers shall have bird screens or removable insect screen at inside face of louver.

Stationary Louver:
The louver blades shall be extruded aluminum. Louvers shall have a drainable blade and shall provide high resistance to water when tested to AMCA Standard 500/511. Furnish with an aluminum bird screen, box frame, and extended sill. Beginning water penetration shall not exceed .01 oz./ft. @ 1000 FPM (4" louver) or 1050 FPM (6" louver) for a 4' x 4' louver. Maximum pressure loss shall be.06" W.G. at 700 FPM gross face velocity (intake). Louvers shall be furnished with an anodized 70% Kynar coating, custom color selected by Architect. Architect to provide paint sample for color match.

Specified: Ruskin #ELF375 D, or ELF6375 D
Substitute: Airline, Penn, Dowco, Arrow, NCA, Pottorff, United Enertech, American Warming, United Enertec, Greenheck

F. Sound Attenuators/Duct Silencers:
Silencers outer casing shall be made of minimum 22 gauge and interior baffles shall be made of minimum 26 gauge galvanized steel. All seams in outer casing shall be lock formed and mastic filled. Casings shall be leak-proof to a pressure differential of 8" water gauge. Acoustical filler material shall be glass fiber, packed under compression and enclosed in fabric film. The entire silencer shall be incombustible, moisture resistant and impart no odor to the air.

Fire Hazard Classification for the acoustical fill when tested in accordance with ASTM E 84 shall be Flame spread 20, Fuel contributed 15, Smoke developed 20.

Static pressure loss dynamic insertion loss & self-generated noise of the Silencer shall have been certified in accordance with ASTM E 477 "Standard Method of Testing Duct Liner Materials and Prefabricated Silencers for Acoustical and Airflow Performance", at an NVLAP accredited laboratory.

Acoustical and pressure drop performance shall be as scheduled on the drawings.

Specified: Price
Substitute: Dynasonics, Rink, Aerosonics, Commercial Acoustics, IAC, Vibro-Acoustics, Semco

G. Roof Curb Sound Treatment:
Roof curb acoustical panels shall be factory laminated construction and shall be provided as indicated on drawings by a recognized manufacturer with published standards of construction and technical performance. Performance of the fabricated and installed system shall conform to all specifications listed herein.

Panel layers shall be comprised of 2" 3PCF AcoustiBoard fiberglass and 5/8" AcousticiSheet as manufactured by Kinetics Noise Control (KNC). STC 47 through STC 60 options shall include added layers of KNM-200B as manufactured by KNC.

All panels and their components shall be pre-fabricated, sectional, and modular; designed for easy and accurate field assembly.

Panel Construction:
All panels shall be 7-1/4" inches thick (min), comprised of alternating layers of 2" fiberglass absorption panels and 5/8" acoustically dampened sheetrock, STC-47 through STC 60 options integrate added layers of KNM-200B barriers (see product submittals for additional information)

Acoustical Performance
Panels shall be rated for either STC (Sound Transmission Class)-37, 47, 52, or 60, as noted on the drawings. The manufacturer shall provide testing data indicating sound absorption and transmission loss characteristics of the panel assembly.

Testing data shall demonstrate minimal performance as follows:

| Transmission Loss dB | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency Hz | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | STC |
| Calculated TL | 16* | 24 | 26 | 32 | 42 | 56 | 62 | 59* | 37 |
| | 21* | 23 | 51 | 58 | 68 | 68 | 77 | 80* | 47 |
| | 23* | 28 | 51 | 58 | 68 | 68 | 77 | 81* | 52 |
| | 26* | 36 | 51 | 59 | 68 | 69 | 80 | 84* | 60 |

*ASHRAE HANDBOOK 2017, CHAPTER 8, EQUATION 39

Field Installed Option:
At the contractor's option, the roof curb acoustical treatment can be field constructed or factory installed by Curb Manufacturer, inside the curb with alternating layers of ½" thick layers of Densglass Gold Plus sheathing and 2" thick, 6 lb per cu. Ft. rigid fiberglass insulation. Provide top layer of 1 lb. per sq. ft. cadium/vinyl lagging material (Kinetics model KNM-100ALQ or equal by Sound Seal.) Caulk all seams.
Contractor shall provide calculations with the submittals indicating the field installed assembly STC (Sound Transmission Class) is equal to the specified value

Specified: Kinetics Noise Control (RT-7 panels)
Substitute: Sound Seal, Mason Industries, BRD Noise Control, Acoustiblok, or prior approved equal.

H. Dampers:

1. Fire Dampers: Dampers shall be UL555 rated. Install dampers in strict accordance with the manufacturer's recommendations and as indicated on the drawings. Dampers in low pressure duct shall be Style "A" or "B". Dampers in high pressure duct shall be Style "B". Ceiling dampers shall be radiation type. Dampers shall be dynamic rated.

   Provide UL listed radiation blanket materials for each ceiling fire damper as required to comply with manufacturer's installation requirements.

   Specified: Ruskin CFD Series (radiation)
   DIBD2 Series (fire only) (curtain type)
   DFD35 Series (pivot type)
   Substitute: Safe Air, Prefco, Advanced Air, Phillips, National Control Air, Air Balance, Pottorff, Louvers and Dampers, Nailor, Greenheck, United Enertech

2. Branch Duct Volume Damper: (Maximum 12" high/rectangular or 14"dia./rd):
   Shall be single-blade, locking quadrant dampers, with 2" stand-off handles for insulated duct.

   Specified: Ruskin, MD-25 (Rectangular)
   Ruskin, MDRS-25 (Round)
   Substitute: Arrow, Louvers & Dampers, Air Balance, Lloyd, Pottorff, Safe Air National Control Air, Nailor, Greenheck, United Enertech

3. Main Duct Volume Damper, Branch Ducts (greater than 12" high or 14"dia), & Return Air Dampers: Shall be multi-blade, opposed blade action type dampers. Dampers shall have flanged faces and be installed in a duct with mating flanges. Dampers shall have either locking quadrant operator or motorized operator if required by control sequence; motor provided by control section of specification.

   Specified: Ruskin CD-35 (Rectangular), CDRS-25 (Round)
   Substitute: Arrow 1770, Louvers & Dampers CD-400, Air Balance, Lloyd, Pottorff, Safe Air, National Control Air, Nailor, Greenheck, United Enertech

4. Motorized Return, Outside Air & Relief Air Dampers:
   Rectangular: Multi-blade, extruded aluminum, air foil, opposed blade action with side linkage or face linkage, suitable for a motorized operator. Low leakage vinyl edge seals and flexible metal jamb seals. Dampers shall have a motorized operator where required by control sequence. Unless noted otherwise, actuators shall be provided by the controls vendor. Damper operator shaft shall extend outside ductwork.

   Round: Dampers shall consist of a single circular blade mounted to a shaft. Inside frame surface shall be clean and smooth with no full circumference blade stops or similar inward projections. Frames shall be aluminum construction and shall include rolled stiffener beads to allow easy sealing of spiral ductwork joints. Damper blade shall be double skin equivalent to 14 gage and shall include a neoprene seal sandwiched between the two sides. Leakage through the damper in the closed position shall not exceed .15 cfm per inch of blade circumference at a pressure differential of 4" w.g. Leakage through the bearings shall be less than 1/4" cfm at 4" static pressure.

   Specified: Ruskin CD-50 (Rectangular)
   Ruskin CDRS-25 (Round)
   Substitute: Arrow Pinlock, Air Balance, Louvers & Dampers TSD-400 UD, Pottorff, Safe Air, National Control Air, Nailor, Greenheck, United Enertech

Dampers specified as “low leakage” shall have a leakage rate which shall not exceed 60 CFM @ 1” W.G. static pressure for a 4’x 4’ damper.

Motor operated dampers with two or more sections shall have a jackshaft connected to a damper face linkage on each section. Damper operator shall be connected to jackshaft. Motor operated dampers shall have an extended shaft for mounting operator outside ductwork.

I. Variable Air Volume Terminals (Hot Water Heat, Fan Powered):

Factory ratings shall be UL listed and labeled by ETL or UL Testing Laboratories. Sound ratings shall be per ARI #880 & #885.

Refer to plans for shut-off, or series, or parallel fan configuration and hot water coil configuration.

Casing shall be 22 gauge galvanized steel with filter rack on plenum inlets. Interior surface of unit casing shall be acoustically and thermally lined with 1” thick, 3.0 lb./cu.ft density elastomeric rubber with high density facing. Insulation shall be UL listed and meet NFPA-90A and UL 181.

Discharge Duct Connection shall be slip and drive or flanged.

Plenum Inlet Filters shall be throwaway, factory mounted in the plenum inlets of the unit. Provide extra filters as indicated in the “Equipment Extra Filter” paragraph A.3.section of these specifications.

Hot Water Coils:
Unit (where required) shall have a factory mounted, one or two row heating coil with 5/8” O.D. seamless copper tubes, mechanically expanded into the fin collars. Coils shall be leak tested at 300 psig air pressure under water and conform to ARI 410 Standards. Connections shall be right or left hand as indicated on the Plans.

A removable insulated panel on bottom of unit shall provide access to fan motor (s).

Fan shall be FC style with galvanized steel fan wheel. Provide a fan relay, disconnect, and 24V transformer (transformer size as indicated by the controls contractor). Motor and fan assembly shall have vibration isolation for the terminal cabinet.

Parallel Fans:
Motors shall be permanently lubricated, single speed, direct drive, permanent split capacitor type with thermal overload protection and designed for use with a SCR speed controller.

Provide a factory mounted fan speed controller to remotely change fan motor speed from BMS.

A removable insulated panel on the bottom of the unit shall provide access to the fan motor.

Dampers:
The primary air damper shall be heavy gauge steel with Delrin or bronze oilite bearings (nylon unacceptable). Damper shall have a synthetic seal to limit leakage. Maximum leak rate shall not exceed 2% at 3” wg. inlet static pressure (per ASHRAE 130).

Controls:
Unit airflow shall be monitored by an integral, multiple point, averaging flow sensing array to maintain constant primary airflow independent of changes in system static pressure. Balancing Contractor shall field set unit minimum and maximum airflows. An integral multiple point, averaging flow sensing ring shall provide primary air flow measurement within +/- 5% of unit rated airflow with 1 ½ diameters

of straight duct upstream of unit. Integral flow taps and calibration chart shall be provided on each unit.

Manufacturer shall include cost for factory mounting controls provided by the successful Building Management system vendor.

Controls shall be provided under the Control Section of these specifications, and integrated into the Building Management system.

Damper operator shall be Belimo, or approved equal, furnished by the successful Building Management system vendor and factory mounted by the manufacturer.

See Control Section of these specifications for Sequence of Operation.

Specified: Price
Substitute: Nailor, ETI

J. Heating Boilers:
QUALITY ASSURANCE

A. ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES: BOILERS MUST BE LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

B. AHRI PERFORMANCE COMPLIANCE: CONDENSING BOILERS MUST BE RATED IN ACCORDANCE WITH APPLICABLE FEDERAL TESTING METHODS AND IS CAPABLE OF ACHIEVING THE ENERGY EFFICIENCY AND PERFORMANCE RATINGS WITHIN PRESCRIBED TOLERANCES.

C. ASME COMPLIANCE: CONDENSING BOILERS MUST BE CONSTRUCTED IN ACCORDANCE WITH ASME BOILER AND PRESSURE VESSEL CODE, SECTION IV “HEATING BOILERS”.

D. ASHRAE/IESNA 90.1 COMPLIANCE: BOILERS SHALL HAVE MINIMUM EFFICIENCY ACCORDING TO "GAS AND OIL FIRED BOILERS - MINIMUM EFFICIENCY REQUIREMENTS."

E. DOE COMPLIANCE: MINIMUM EFFICIENCY SHALL COMPLY WITH 10 CFR 430, SUBPART B, APPENDIX N, "UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF FURNACES AND BOILERS."

F. UL COMPLIANCE: BOILERS MUST BE TESTED FOR COMPLIANCE WITH UL 795, "COMMERCIAL-INDUSTRIAL GAS HEATING EQUIPMENT." BOILERS SHALL BE LISTED AND LABELED BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

G. NOX EMISSION STANDARDS: WHEN INSTALLED AND OPERATED IN ACCORDANCE WITH MANUFACTURER’S INSTRUCTIONS, THE FOLLOWING CONDENSING BOILER MODELS SHALL COMPLY WITH THE NOX EMISSION STANDARDS OUTLINED IN SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD), RULES 1146, 1146.1, OR 1146.2; AND THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ), TITLE 30, CHAPTER 117, AND RULE 117.465 OR THE NOX EMISSIONS REFERENCED BELOW:

- BMK750-2000, BMK4000-6000: 9 PPM NOX CORRECTED TO 3% OXYGEN AT ALL FIRING RATES WHEN FIRING ON NATURAL GAS
- BMK2500-3000: 20 PPM NOX CORRECTED TO 3% OXYGEN AT ALL FIRING RATES WHEN FIRING ON NATURAL GAS

WARRANTY

A. STANDARD WARRANTY: BOILERS SHALL INCLUDE MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF BOILERS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.
   1. WARRANTY PERIOD FOR FIRE-TUBE CONDENSING BOILERS
      a. The pressure vessel/heat exchanger shall carry a 10-year from shipment, non-prorated, limited warranty against any failure due to condensate corrosion, thermal stress, mechanical defects or workmanship.
      b. The pressure vessel is warranted against failure due to thermal shock for the lifetime of the boiler provided the boiler is installed, controlled, operated and maintained in accordance with the operation and maintenance manual.
      c. The burner shall be conditionally guaranteed against any failure for (5) five years from shipment.
      d. Manufacturer labeled control panels are conditionally warranted against failure for (2) two years from shipment.
      e. All other components, with the exception of the igniter, flame detector and $O_2$ sensor, are conditionally guaranteed against any failure for (18) months from shipment.

CONSTRUCTION

A. Description: Boiler shall be natural gasfired fully condensing fire tube design. It shall be design to operate in variable primary or primary secondary piping configuration. Power burner shall have full modulation, discharge into a positive or negative pressure vent.

B. Boiler efficiency shall increase with decreasing load (output), while maintaining setpoint. Boiler shall be factory-fabricated, factory-assembled and factory-tested, fire-tube condensing boiler with heat exchanger sealed pressure-tight, built on a steel base, including insulated jacket, flue-gas vent connections, combustion-air intake connections, water supply, dual inlet returns condensate drain connections, and controls.

C. Heat Exchanger: The heat exchanger shall be constructed of 439 stainless steel fire tubes and tubesheets, with a one-pass combustion gas flow design. The fire tubes shall be 1/2" or 5/8" OD, with no less than 0.049" wall thickness. The upper and lower stainless steel tubesheet shall be no less than 0.25" thick. The pressure vessel/heat exchanger shall be welded construction. The heat exchanger shall be ASME stamped for a working pressure not less than 150 psig. Access to the tubesheets and heat exchanger shall be available by burner and exhaust manifold removal. Minimum access opening shall be no less than 8 inch diameter.

D. The boiler water connections shall be flanged 150-pound, ANSI rated. The pressure vessel shall be constructed of ASME SA53 carbon steel, with a 0.25 inch thick wall and 0.50 inch thick upper head. Inspection openings in the pressure vessel shall be in accordance with ASME Section IV pressure vessel code. The boiler shall be designed so that the thermal efficiency increases as the boiler firing rate decreases.

E. Modulating Air/Fuel Valve and Burner:

The burner shall not operate above 7.5% oxygen level or 55% excess air. The burner shall produce less than 13 ppm of NOx, under standard calibration, corrected to 3% excess oxygen when firing on natural gas. The burner shall be metal-fiber mesh covering a stainless steel body with spark or proven pilot ignition and flame rectification. All burner material exposed to the combustion zone shall be of stainless steel construction. There shall be no moving parts within the burner itself. A modulating air/fuel valve shall meter the air and fuel input. The modulating motor must be linked to both the gas valve body and air valve body with a single linkage. The linkage shall not require any field adjustment. A variable speed cast aluminum pre-mix blower shall be used to ensure the optimum mixing of air and fuel between the air/fuel valve and the burner.

a. Fuel: the unit gas train shall be specifically designed and calibrated for natural gas. The gas train shall be a ventless gas train.
b. Minimum boiler efficiencies shall be as follows at a 20ºF delta-T:

| EWT | 100% Fire | 50% Fire | 7% Fire |
|---|---|---|---|
| 160 °F | 86.5% | 87% | 87% |
| 140 °F | 87% | 87.5% | 87.5% |
| 120 °F | 88.5% | 89% | 90% |
| 100 °F | 93.2% | 94.5% | 95.2% |
| 80 °F | 95.6% | 96.8% | 98.2% |

c. Exhaust Manifold: The exhaust manifold shall be of corrosion resistant cast aluminum or 316 stainless steel with the following diameter flue connections:

d. The exhaust manifold shall have a collecting reservoir and a gravity drain for the elimination of condensation.

F. Blower: The boiler shall include a variable-speed, DC centrifugal fan to operate during the burner firing sequence and pre-purge the combustion chamber.

1. Motors: Blower motors shall comply with requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
   a. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require a motor to operate in the service factor range above 1.0.

G. Ignition: Ignition shall be via spark or proven pilot ignition with 100 percent main-valve shutoff and electronic flame supervision.

H. Combustion Air: The boiler shall be designed such that the combustion air is drawn from the inside of the boiler enclosure, decoupling it from the combustion air supply and preheating the air to increase efficiency.

I. Combustion Air Filter: The boiler shall be equipped with an automotive high flow air filter to ensure efficient combustion and unhindered burner components operation.

J. Enclosure: The plastic and sheet metal enclosure shall be fully removable, allowing for easy access during servicing.

K. $O_2$ sensor located in the Combustion Chamber: The boiler shall be equipped with an Oxygen sensor. The sensor shall be located in the boiler combustion chamber. Boilers without Oxygen sensor or

boilers with an Oxygen sensor in the exhaust shall not be acceptable due to measurement estimation and performance accuracy.

CONTROLS

A. The boiler shall have an integrated boiler control that is capable of operating the boiler and associated accessories including but not limited to: its pumps, valves and dampers.

1. The control shall have a 5 inch color touch screen display as well as six function buttons that are separate from the display. User shall have the ability to navigate the menus via touchscreen or navigation buttons. Controls not equipped with navigation button options shall not be permitted.
2. The control shall be equipped with a multi-color linear LED light to indicate the level of firing and/or air/fuel valve position.
3. The control shall display two temperatures using two dedicated three-digit seven-segment displays.
4. The control shall offer an Enable/Disable toggle switch as well as two buttons for Testing and Resetting the Low Water Cutoff.

B. The Manager designated boiler control shall be capable of the following functions without the need for additional external controls:

1. Sequence up to 16 boilers,
2. Control boiler variable speed or single speed pumps and/or modulating motorized valves,
3. Operate or modulate a variable or single speed system pump or rotate two system pumps,
4. Control and communicate with up to 6 SmartPlate domestic water heaters and their domestic hot water pump,
5. The control shall connect to other plant boiler controls using RS485 and communicate using Modbus protocol.

e. The control system shall be segregated into three components: “Edge [ii]” Control Panel, Power Panel and Input/Output Connection Box. The entire system shall be Underwriters Laboratories recognized.

f. The control panel shall consist of seven individual circuit boards using surface-mount technology in a single enclosure. Each board shall be individually field replaceable. These circuit boards shall include:

1. A microcontroller board with integrated 5 inch touchscreen color display providing the user interface.
2. A 7-segment display board. This board includes two 3-digit 7-segment displays. These displays shall be used to view a variety of temperature sensor values and operating and startup function status.
3. An Interface board connects the microcontroller board to internal components using ribbon cables.
4. An electric low-water cutoff board connects to the test and manual reset functions on the microcontroller board.
5. A power supply board is designed to provide the different DC voltages to the rest of the boards. It also acts as voltage regulator and reduce power noise.
6. An ignition and combustion board. This board controls the air/fuel valve and Safety Shutoff Valve, flame status and ignition transformer
7. A connector board used to connect all external electrical connection.

g. Combination plant: The managing boiler control shall be capable of setting and managing a combination plant that consist of up to two groups of boilers, their swing boilers and swing valves. The control shall be capable of performing all the listed features without the need for any additional controls. The use of additional controls to achieve any of these functionalities shall be prohibited to simplify installation and plant management. The combination plant control shall have the following capabilities:

i. The control shall operate one group of boilers for heating and another group of boilers for domestic hot water using plate heat exchangers or indirect tanks.
ii. The control shall manage and rotate the lead boiler in each of the two groups independent of the other group.
iii. The control shall be capable of managing one or two swing boilers and their motorized swing valves to direct the output of the swing boiler(s) to one of the two groups based on the plant priority settings. The control shall also connect to the header and return sensors for each of the two groups of boilers and use those values to manage the set point for each group.
iv. The control shall offer two independent logics that run simultaneously managing each group of boilers. Each boiler group logic shall have its temperature values, setpoints, PID and feedback parameters that is independent of the other group settings and parameters.

h. System Pump lead/lag rotation: The control shall be capable of operating two system pumps. It shall rotate the lead pump based on user time setting. The use of an external pump lead-lag control shall not be permitted unless function is performed by building management system.

i. Variable Speed Pump: The control shall be capable of modulating a variable speed pump. It shall modulate the pump based on the boiler firing rate, the boiler plant firing rate, or based on the return header temperature differential from supply water temperature on a primary secondary piping application.

j. Minimum number of boiler plant open valves: The control shall manage the minimum number of boiler motorized valves to reduce variable speed pump flow and energy used. The control shall offer a setting to control the number of valves open during low load and standby operation. Manufacturers without this feature shall offer additional pump controller and a smaller single speed pump to run during the low load and standby periods.

k. Control settings transfer using USB: The control shall simplify and significantly lessen startup and boiler setting time by being able to use a USB flash drive to copy settings from one boiler to another boiler. Installers shall use successfully preconfigured boiler settings in their portfolio to newly installed boilers.

l. Combustion calibration: The control shall offer at least 5 calibration points. The use of less than 5 calibration points is not permitted to improve overall system efficiency under all firing rates. Each combustion calibration point shall operate with 5 to 7% $O_2$ levels to improve operating efficiency. Deviating away from these values shall not be acceptable.

m. Assisted Combustion Calibration: The control shall offer an assisted combustion calibration feature to help reduce setup time and improve setup accuracy. The assisted combustion calibration shall adjust the $O_2$ level at each calibration point to help keep $O_2$ level within allowable efficiency. The control shall log, date and time stamp the calibrated point combustion values of $O_2$ and allow the user to log NOx, CO and flame strength. The control shall check these values against manufacturer allowable combustion values and color identify values out of manufacturer acceptable ranges. As an additional capability, the control shall also have the ability to perform manual combustion calibration. Not having Assisted Combustion Calibration function shall be prohibited.

n. Valve Balancing: To help simplify installation and as part of a boiler plant, the control shall be capable of controlling an electronic modulating motorized valve for each of the boilers using the manager boiler control. It shall have a built-in logic to provide a maximum flow using an adjustable valve opening percentage point for each boiler. The control shall be capable of closing any valve that has an off boiler. If all boilers are off, the control shall keep at minimum one valve open to protect pumps.

o. Building Automation: The control shall be able to communicate to Building Management Systems using BACnet and Modbus without the use of external gateways. The control shall be able to communicate

over each of the two protocols using IP as well as RS485. The use of external gateways is not acceptable. The control shall be able to communicate to the building management system using:

i. BACnet MS/TP and BACnet IP/Ethernet. When communicating over BACnet IP, the control shall offer an additional layer of IP security by mapping all control BACnet IP communication to the BACnet server's IP and MAC addresses. Not having this level of security shall deem the IP communication insecure and shall not be acceptable.
ii. Modbus RTU and Modbus IP.

p. Unit and Plant Status: The control shall provide a quick view of the unit status and plant status.
   i. The unit status screen shall provide temperature setpoint, all water inlet and outlet and supply air and exhaust temperature sensors' values. It shall also provide unit current and target firing rates. Additional screens shall display unit run hours, cycle count and average cycles per hour.
   ii. The plant status screens shall provide plant temperature setpoint, plant water supply and return temperatures, outdoor temperature and domestic hot water setpoint and current temperatures. Additionally, a status screen shall show the boiler status of each plant unit, plant firing rate.
   iii. Unit and Plant event history: The manager control shall display the last 500 historical events per plant or 200 historical events for single unit installations.

q. Software update: The control shall be capable of field software updates without a need for hardware component(s) replacement. This shall be performed either using software on a USB flash drive or via Internet connection. The software update mechanism shall be performed by a trained technician. The software update menus shall be secured using a password level. After the software update, the control shall retain all of its prior field settings.

r. Copy settings from one boiler to the other: To significantly reduce installation time by reducing long repetitive work, the control shall have the capability of saving its settings to a USB flash drive. In addition, the control shall have the ability of copying new settings from a flash drive.

s. Programmable Inputs and Outputs: The control shall be equipped with multiple relay and analog outputs and dry contact and analog inputs. Each shall be field programmable to meet installation needs. The following I/O options shall be available:
   i. Relay outputs: There shall be two output relays that are programmable. The following relay functions shall be selectable:
      1. Swing Valve 2
      2. System Pump
      3. Summer Pump
      4. Multi-temperature pump
      5. Pump2
      6. Louver
   ii. Inputs and interlocks: The following control functions shall be available:
      1. Flow input
      2. Damper end switch input
      3. Louver end switch input
   iii. Analog output: There shall be three analog outputs that are programmable. The control shall have configurable analog outputs that can be used as one of the following options:
      1. Boiler pump
      2. Domestic hot water variable speed pump
      3. Valve
      4. Fire rate
   iv. Analog input: There shall be three analog inputs that are programmable. The control shall have configurable analog inputs that can be used as one of the following options:
      1. Remote setpoint
      2. Smart Plate valve position
      3. Domestic ho t water variable speed pump flow

t. Backup boiler: The control shall be able to operate a lower efficiency back up boiler during peak periods when main plant boilers are at or close to peak load.

u. Communication with SmartPlate: The control shall be capable of controlling and monitoring one or multiple plate heat exchanger(s). It shall be able to:
   i. Change the domestic hot water temperature setpoint and read its current temperatures.
   ii. Monitor 3-way valve position.
   iii. Control the operation of the domestic hot water pump.

v. The controls shall annunciate boiler and sensor status and include extensive self-diagnostic capabilities.

w. The control panel shall incorporate:

   1. Setpoint High Limit: Setpoint high limit allows for a selectable maximum boiler outlet temperature and acts as temperature limiting governor. Setpoint limit is based on a PID function that automatically limits firing rate to maintain outlet temperature within a 0 to 10 degree selectable band from the desired maximum boiler outlet temperature.
   2. Setpoint Low Limit: Allow for a selectable minimum operating temperature.
   3. Failsafe Mode: Failsafe mode allows the boiler to switch its mode to operate from an internal setpoint if its external control signal is lost, rather than shut off. This is a selectable mode, enabling the control can to shut off the unit upon loss of external signal, if so desired.

x. The boiler control system shall incorporate the following additional features for enhanced external system interface:

   1. System start temperature feature
   2. Pump delay timer
   3. Auxiliary start delay timer
   4. Auxiliary temperature sensor
   5. Analog output feature to enable simple monitoring of temperature setpoint, outlet temperature or fire rate
   6. Remote interlock circuit
   7. Delayed interlock circuit
   8. Easy Setup by providing simplified menu quick settings to expedite plant and boiler setup
   9. Delta-T Limiter
   10. Freeze protection
   11. Fault relay for remote fault alarm
   12. Warm-weather shutdown
   13. The control shall offer multi-level user security access using different passwords. For additional security, the passwords shall expire if control display was not touched for an extended period 30 minutes.

y. Each boiler shall include an electric, single-seated combination safety shutoff valve/regulator with proof of closure switch in its gas train. Each boiler shall incorporate dual over-temperature protection with manual reset, in accordance with ASME Section IV and CSD-1.

z. O2-Trim or AERtrim: Each boiler shall be equipped with the patented AERtrim system, an advanced $O_2$-trim system for condensing boiler applications. The system shall utilize a low cost reliable automotive $O_2$ sensor that measures and monitors the oxygen content of the exhaust gases. The system shall adjust the blower speed to maintain optimal air-fuel ratios in the event of any site condition changes (air density, gas pressure, BTU content, etc.). The system shall have the following capabilities:

i. Self-Diagnostics
   1. System Status and Error Messages
   2. When excessive trimming is occurring
   3. When $O_2$ sensor has fallen out of calibration

ii. Adjustable parameter settings
   1. $O_2$ target and range to meet site requirements
   2. Schedule daily or weekly self-diagnostics

Output of $O_2$ information shall be displayed on the Edge [ii] control panel.

The $O_2$ sensor shall be installed through the unit's burner plate and measure the oxygen content directly within the unit's combustion chamber.

Boilers without an equivalent $O_2$ trim will be deemed unacceptable. Due to the moisture content of flue gases from condensing boilers, placing the $O_2$ sensor in the exhaust manifold or stack will be deemed unacceptable.

Boilers which require their $O_2$ sensor be changed annually will be deemed unacceptable.

aa. Each boiler shall be onAER ready with a standard Ethernet port and include a 5 year onAER subscription at no additional charge. AERCO's onAER service grants the user online access to real time operation and status of their system plant from any computer, tablet or mobile device along with the following capabilities:
   i. Efficiency status and trends
   ii. O2 levels
   iii. Efficiency and performance optimization tips
   iv. Preventative Maintenance alerts and scheduling
   v. Predictive Maintenance algorithms.
   vi. Warning and error messages
   vii. Weekly or monthly performance and status reports
   viii. Manage multiple boiler plants or buildings
   ix. Customizable dashboard
   x. Add email contacts for alerts and reports, including local AERCO trained technicians
   xi. Manage and store startup, maintenance and service documentation

   The boiler manufacturer shall be able to provide a network hub or a network switch to connect up 16 boilers to an online network.

bb. Each boiler shall have integrated Boiler Sequencing Technology (BST), capable of multi-unit sequencing with lead-lag functionality and parallel operation. The system will incorporate the following capabilities:
   i. Efficiently sequence 2-to-16 units on the same system to meet load requirement.
   ii. Integrated control and wiring for seamless installation of optional modulating motorized valve. When valves are utilized, the system shall operate one motorized valve per unit as an element of load sequencing. Valves shall close with decreased load as units turn off, with all valves open under no-load conditions.
   iii. Automatically rotate lead/lag amongst the units on the chain and monitor run hours per unit and balance load in an effort to equalize run hours among active units.
   iv. Option to manually designate lead and last boiler
   v. Designated manager control, used to display and adjust key system parameters.
   vi. Automatic bump-less transfer of master function to next unit on the chain in case of designated master unit failure; master/slave status shall be shown on the individual unit displays.

cc. For boiler plants greater than 16 units, the Boiler Manufacturer shall supply as part of the boiler package a completely integrated AERCO Control System (ACS) to control all operation and energy input of the multiple boiler heating plant. The ACS shall be comprised of a microprocessor based control utilizing the MODBUS protocol to communicate with the Boilers via the RS-485 port. One ACS controller shall have the ability to operate up to 32 AERCO boilers.

The controller shall have the ability to vary the firing rate and energy input of each individual boiler throughout its full modulating range to maximize the condensing capability and thermal efficiency output of the entire heating plant. The ACS shall control the boiler outlet header temperature within $\pm$2ºF. The controller shall be a PID type controller and uses Ramp Up/Ramp Down control algorithm for accurate temperature control with excellent variable load response. The ACS controller shall provide contact closure for auxiliary equipment such as system pumps and combustion air inlet dampers based upon outdoor air temperature.

The ACS shall have the following anti-cycling features:

- Manual designation of lead boiler and last boiler.
- Lead boiler rotation at user-specified time interval.
- Delay the firing/shutting down of boilers when header temperature within a predefined dead band.

When set on Internal Setpoint Mode, temperature control setpoint on the ACS shall be fully field adjustable from 50ºF to 190ºF in operation. When set on Indoor/Outdoor Reset Mode, the ACS will operate on an adjustable inverse ratio in response to outdoor temperature to control the main header temperature. Reset ratio shall be fully field adjustable from 0.3 to 3.0 in operation. When set on 4ma to 20ma Temperature Control Mode, the ACS will operate the plant to vary header temperature setpoint linearly as an externally applied 4-20 ma signal is supplied.

When set on MODBUS Temperature Control Mode, the ACS will operate the plant to vary header temperature setpoint as an external communication utilizing the MODBUS protocol is supplied via the RS-232 port. The ACS controller shall have a vacuum fluorescent display for monitoring of all sensors and interlocks. Non-volatile memory backup of all control parameters shall be internally provided as standard. The controller will automatically balance the sequence of operating time on each boiler by a first-on first-off mode and provide for setback and remote alarm contacts. Connection between central ACS system and individual boilers shall be twisted pair low voltage wiring, with the boilers ‘daisy-chained’ for ease of installation.

ELECTRICAL POWER

A. Controllers, Electrical Devices and Wiring: Electrical devices and connections are specified in Division 26 sections.

B. Single-Point Field Power Connection: Factory-installed and factory-wired switches, motor controllers, transformers and other electrical devices shall provide a single-point field power connection to the boiler.

VENTING

A. The boiler shall be capable of venting in Polypropylene venting material. The exhaust vent must be UL Listed for use with Category II, III and IV appliances and compatible with condensing flue gas service. UL-listed vents of Polypropylene or Al 29-4C stainless steel must be used with boilers.

B. Combustion-Air Intake: Boilers shall be capable of drawing combustion air from the outdoors via a metal or PVC duct connected between the boiler and the outdoors.

C. Common vent and common combustion air must be an available option for boiler installation. To improve system efficiency, multi-boiler system shall utilize sequencing logic with common venting as well as individual boiler venting configuration. Manufacturers not allowing parallel modulation

for common shall not be acceptable. Consult manufacturer for common vent and combustion air sizing.

Vented gas pressure regulator and over-pressurization device (where required,) shall be provided by the boiler manufacturer.

Specified: Aerco “Benchmark”
Substitute: Patterson Kelly, Lockinvar

K. Combustion Vent Stacks:

1. Condensing (Category I or IV), Polypropylene:
   Positive Pressure Vent: The vent shall be polypropylene, designed for use with Category II, or IV condensing gas fired appliances

   All products furnished under this Section shall conform to the requirements of The National Fuel Gas Code, ANSI Z223.1/NFPA-54 where applicable and shall comply with and be listed to UL-1738, the US Standard for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV, and ULC-S636-95, the Canadian Standard for Type BH gas vent systems. All vent materials shall be rated for continuous UV exposure (ASTM G23-81).

   A. The vent shall be of the single wall, factory-built type, designed for use in conjunction with Category II, or IV condensing gas fired appliances, condensing oil-fired appliances or as specified by the heating equipment manufacturer.
   B. Maximum continuous flue gas temperature shall not exceed 230 degrees F (110 degrees C).
   C. Vent shall be listed for a maximum positive pressure rating of 20” w.c.
   D. The vent system shall be continuous from the appliance’s flue outlet to the vent termination outside the building. All systems components shall be UL/cUL listed and supplied by the same manufacturer.
   E. The vent shall be constructed from Flame Resistant Polypropylene.
   F. All systems components such as vent supports, roof or wall penetrations, terminations, appliance connectors and drain fittings required to install the vent system shall be UL/cUL listed and provided by the vent manufacturer.
   G. All systems components shall include a factory- installed gasket in their female-end to render the vent air and water tight when the male/female ends are pushed together as per manufacturer’s instructions. Vent systems requiring field installed sealants or compounds shall not be acceptable.
   H. Vent layout shall be designed and installed in compliance with manufacturer’s installation instructions and all applicable local codes.

   The vent system shall be routed for zero clearance to combustibles as specified by the manufacturer.

   Stack shall extend a minimum distance above roof elevation, in accordance with manufacturer's instructions.

   Chimney manufacturer shall provide calculations for each vent system. Chimney manufacturer shall provide all dampers and accessories necessary to ensure proper draft, per the vent calculations. Submit calculations with shop drawings.

   The manufacturer shall warrant the Positive Pressure Vent System against defects in material and workmanship for a period of 10 years from the date of the original installation. Any portion of the

vent repaired or replaced under the warranty shall be warranted for the remainder of the original warranty period.

Specified: Centrotherm
Substitute: By prior approval

L. Pumps (Base Mounted & End Suction):
Pumps shall have capacity as shown in Pump Schedule on drawings. Pumps shall be furnished with C.I. volutes, bronze or stainless steel impellers, and ceramic faced mechanical seals, ball bearings. Suction and discharge shall have flanged connections.

Pumps shall be connected through flexible type couplers to 1750 RPM open dripproof motors. Provide coupler guards. Base plates shall be either cast iron or reinforced steel. Base mounted pumps shall be rear pull-out design, with center drop-out spacer coupling for service without breaking pipe connections or repositioning the motor. Base mounted pumps for chilled water service shall have a condensate drip pan with pipe nipple. Volute shall have an integral cast, solid foot support bolted to the base frame.

Provide tapped gauge openings at suction and discharge nozzles. Pumps shall be constructed for maximum working pressure of 125 psi and $225^0$ F.

All pumps shall have a VSD rated coupling and motor. Any pump motors exposed to the weather shall have TEFC motors.

Specified: Bell & Gosset Series 1510
Substitute: Taco, Armstrong; Grundfos

M. Pumps (In-line, horizontal or vertical mounted):
Pumps shall have capacity as shown in Pump Schedule on drawings. Pumps shall be furnished with C.I. volutes, bronze or stainless steel impellers, and internally flushed ceramic faced mechanical seals

Pumps shall be connected through solid shaft to VSD rated 1750 RPM open dripproof motors. Pump shall be serviceable without breaking pipe connections.

Provide tapped gauge openings at suction and discharge nozzles. Pumps shall be constructed for maximum working pressure of 175 psi and $225^0$ F.

Specified: Bell & Gossett Series 80
Substitute: Taco, Armstrong, Grundfos

N. Bipolar Ion Generator (Needlepoint):
The bi-polar ionization system shall be tested to UL 867-2007 including the ozone chamber test. Ionization units shall be certified according to UL 2998 as an ozone free device. All units shall have alarm output contacts.

Unit shall be independently tested verifying the following kill rates:
E.coli = 99.68% in 15 minutes
MRSA = 96.24% in 30 minutes
TB = 69.01% in 60 minutes
Unit shall produce a minimum of 15 million ions/cc as measured 2 inches from the device's output and shall have direct sensing circuitry of the ion output.

Units designed for duct mounting shall be manufactured of stainless steel and shall contain illuminated power switch, dry contact alarm output, green LED to prove ion output is operating and stainless steel or carbon fiber ion needles. Duct mounted products shall operate from 12VDC, 24VAC, or 90VAC to 240VAC.

Units designed for mounting inside of a RTU/AHU shall be manufactured from UL 94VO rated composite material with carbon fiber needles every 0.50" apart and shall be custom fit to the full width of the cooling coil in six inch modular sections. The ionization system shall be of a shock free design and listed to UL 867. The system shall be certified by UL 2998 as being ozone free. The system shall include a power supply with illuminated on/off switch, plasma "on" indication, and be capable of powering up to six ionization bars at any length. Ionization bars shall be the full width of the cooling coil, no exception. For coils greater than 60" in height, multiple ionization bars shall be provided and spaced minimum (1) ionization bar per 60" of coil height. The power supply shall be rated for single phase 24VAC @ 0.63A, 115VAC @ 0.13 amps or 230VAC @ 0.7 amps, consuming no more than 15 watts of power. Unit mounted systems shall generate 60 million ions/cc per inch of the bar (#GPS-iMOD).

Product should have Ionization testing results, demonstrating a 99.4% reduction rate on a SARS-CoV-2 (COVID-19) surface strain within 30 minutes.

Air purifier manufacturer shall provide (2) air ion counters for the project. The air ion counter shall meet the following specifications/features:

- Range/Resolution: 2 million / 10 (ions per cc.)
- Accuracy: +/- 20% of reading
- Noise: 10 ions/cc (2.5 or 14 second averaging selectable)
- Air ion meter shall be powered by (4) AA batteries and shall have a low battery indicator light.
- AC power adapter
- Data Recording
- Data transfer via USB

Air ion meter shall be #AIC2 by AlphaLab, Inc or equal.

One air ion counter shall be for construction use to allow the HVAC contractor and test & balance contractor to verify purifier operation. This "construction use" ion counter, along with the 2nd (unused) ion counter, shall be turned over to the owner at the completion of the job. The "construction use" ion counter shall be turned over to the owner in "like new" condition.

Specified: Global Plasma Solutions
Substitute: Phenomenal Aire, Plasma Aire

O. Electric Unit Heaters:
Coils shall be high mass, tubular finned steel, sheathed heating elements, with thermal cut-outs.

Motors shall be permanent split capacitor type with thermal overload protection.

Each unit shall be furnished with a directional adjustable louver face or adjustable mounting.

Provide units with integral thermostat.

Specified: Markel
Substitute: Raywall, Trane, Q-Mark

CONTROLS:

A. General:

1. It is the intent of these specifications to provide for the installation of a complete system of automatic temperature and humidity control. The system shall be designed for continuous automatic operation with a minimum of maintenance and equipment.

2. All work performed under this section shall be done by an independent controls contractor who specializes in the manufacturing, installation and servicing of automatic control systems for HVAC applications. The entire HVAC Controls scope of work shall be included in the HVAC subcontract. Controls contractor shall be Siemens (Charlotte Office; Contact - Nick Grothe nicholas.grothe@siemens.com).

   Provide DDS Building automation system components, 100% compatible with existing Siemens system located on all SCC campuses, to control and/or monitor the following:
   a. Power consumption from equipment from HVAC and lighting system.
   ~~b.~~ Lighting Controls, provided they communicate Via BACnet/IP.

   All controls shall be BACnet/IP-based, using college's BACnet/IP network, in lieu of using stand-alone MS/TP field bus to communicate to the supervisor panel. Coordinate the network design with SCC HVAC Supervisor.

   All Desigo Project files are to be submitted to SCC HVAC Supervisor Prior to deployment. All Project files are to be limited to one file per building / BACnet subnet.

   All New graphics are to be approved prior to deployment by SCC HVAC Supervisor.

   All Device Names, Device Instance Numbers and Device IP Addressing to be assigned by SCC HVAC Supervisor.

   No BACnet MS/TP, No Modbus, or any third, (3rd), party devices or software to be used for communication between the Siemens Building Automation System and any mechanical systems <u>without written consent</u> from SCC HVAC Supervisor / Campus Operations Director or his designee. Third (3rd) party devices and software may be used for informational purposes only, not for start / stop, status, and alarms.

   All controls submittals shall be approved by the SCC HVAC Supervisor / Campus Operations Director or his designee prior to releasing for production/order/construction.

3. Unless noted otherwise, all materials, labor and equipment required for the control systems hereinafter specified shall be provided by the Controls Contractor. The control vendor shall be responsible for coordination with the HVAC equipment vendor's interconnected hardware and software, as required to fulfill the specified Sequence of Operation. Provide necessary integrators, gateways, transducers, etc. or other hardware and software needed for the system operation.

4. All control wiring and conduit, including necessary transformers, relays and interlock wiring of the devices covered under this control section, shall be detailed, furnished and installed under this division of the specifications. All wiring shall be in the strict accordance with the National Electric Code and all applicable local codes.

5. All wiring in return air plenums shall be UL rated for non-combustion and smoke developed per ASTM B84.

6. All control components shall communicate via hard wired conductors (copper or fiber). This includes all communication within the HVAC Building Management components and communication between the HVAC controls and the building owner's local area network.

7. Provide power for all control panels, controllers, and actuators from nearest electrical panel. Controls contractor shall provide all conduit, wiring, and branch panel circuit breakers as required. See electrical drawings or existing panels for locations. Where applicable, control power may be provided with the terminal equipment's motor starter or factory controls, refer to the individual equipment specs (blower coils, VAV terminals, fan coil units, heat pumps, motor starters).

8. Coordinate locations for data drops with electrical contractor and owner.

9. Provide necessary assistance to Test & Balance Contractor to allow set-up and confirmation of air and water quantities; or at no cost, make available any necessary hardware and software required to set-up and/or measure maximum or minimum flow rates and temperature differentials.

B. HVAC Commissioning:
Provide necessary services to assist the building commissioning/functional testing agent, owner, and/or engineer as required to demonstrate the proper function and control of the entire HVAC system.

~~1.~~ Meet on-site with technicians performing factory startup (see "Equipment") specifications.

In addition to start-up services, meet on-site with the factory technician, after the controls system is substantially completed, to interface with factory controllers, ensure the correct points are implemented in the BCS, and verify the sequence of operations.

2. Provide a minimum of two days instruction on the system operation to the owner.

3. Actuator fail positions: Outside air dampers shall fail closed. Return air dampers shall fail open. Terminal unit hot water control valves shall fail open.

C. Guarantee:
1. The control system herein specified shall be free from defects in workmanship and material under normal use and service. If within a period of twenty four (24) months from the date of completion any of the equipment herein described is proved to be defective in workmanship or materials, it will be replaced or repaired free of charge to the Owner.

2. After completion, Contractor shall provide any service incidental to the proper performance of the control system under guarantees outlined above.

D. Shop Drawings and Equipment Submittals:
Submit the following in accordance with the requirements of paragraph entitled "Shop Drawings".

1. Submit manufacturer's literature and certified prints on each control component in the control systems.

Submittals shall include detailed valve and damper schedules.

2. Submit complete electrical wiring diagrams of the entire control systems.

a. Electrical System Wiring Diagrams:

1. Elementary Wiring Diagrams: Show the complete interconnected control system in "ladder" diagram: form with all external and internal connections and devices for motor starters, control panels, external pilot and safety devices and such other equipment terminal points with correct identification.

2. Interconnection Wiring Diagrams: Shall show all field wiring required between the various controllers, starters, panels and remote mounted devices, with conductor and terminal identification corresponding to the elementary wiring diagram.

E. Adjusting:
1. The contractor shall install, calibrate and check all control components of all systems. Contractor shall ensure proper adjustment of all controls and correct sequencing of valves and damper motors for all systems.

2. The final precise adjustments of valves, dampers and other controls to maintain design conditions shall be the sole responsibility of the controls contractor.

F. Record Drawings:
Upon completion of the work, the Contractor shall provide as-built system drawings of the entire control system. The drawings shall have certification of correctness on the face of the drawings. The as-built drawings shall become a part of the Operation and Maintenance literature.

As-built drawings shall include a list of all BACnet objects provided and deployed within the BMS system. The list shall include all BACnet objects within the BMS vendor's BACnet controllers, as well as BACnet objects integrated into the BMS from controllers provided by HVAC equipment suppliers. Minimum required information for each BACnet Object includes: Device ID; Object Type; Object ID; and BACnet Object Name. This "BACnet Addressing As-Built Document" shall be provided in hard copy (paper) format, as well as in electronic searchable format (such as Excel or PDF). The list shall be limited to BACnet Objects deployed and/or integrated into the system. Additional unused or 'spare' BACnet points within a BACnet device shall specifically be excluded.

G. Installation:
1. All control wiring, including low voltage wiring, shall be run in EMT conduit. Where a cable tray is available (by Div.26 Electrical), low voltage wire may be laid in the tray, at the contractor's option. All wiring outside the tray shall be run in conduit. At the contractor's option, where conduit is exposed above a ceiling, in a mechanical room, or in an equipment mezzanine, a section of flexible metal conduit (FMT) may be used at the end of the EMT where it connects to a terminal unit, controller, valve, or other terminal device. The maximum length of FMT shall be 6'. Wiring shall be installed in accordance with Division 26, Electrical, of these specifications.

2. In unfinished areas, electrical conduit shall be neatly fastened to the ceiling, walls or columns with approved hangers, brackets, or straps and shall not be placed on or supported by ductwork. In finished areas all conduit shall be concealed.

3. All components of the control system shall be installed to allow ample space on all sides for maintenance of components and to permit installation of wiring by others.

4. In occupied spaces, the top of thermostats and sensors shall be mounted 4'-0" above finished floor. Mount top of thermostat/sensor at 7'-0" AFF in corridors, stairwells, and group toilets. For sensors on existing walls, exposed wire mold shall be used.

5. Pipe temperature sensing devices shall be immersion type. Coordinate immersion well locations with mechanical contractor.

H. Demolition:
Remove all unused or abandoned wiring and pneumatic tubing (exposed and in cable trays or conduit) and all unused and abandoned control devices, control cabinets, and sensors. Empty conduit may remain in place where not in conflict with other wiring routes or equipment.

I. Materials and Equipment:

1. Name Plates:
   a. Nameplates outside of control cabinets shall be constructed of laminated phenolic material, black exterior with white core. All controls shall be provided with nameplates. Attach nametags with screws, pop rivets, or chains.

   b. Nameplates provided for all panel mounted “read-out” instrumentation shall also show operating ranges where applicable.

2. Control Cabinets:
   a. Construction:
   Control panels shall be shop fabricated with a NEMA rated enclosure, hinged and with a locking latch.

   Relays shall be plug-in mounted and replaceable without disconnecting wiring connections.

   All wiring within the cabinet shall be terminated on screw connected, terminal board/strips. High voltage and control voltage shall be segregated into separate wiring gutters and terminal boards. Wire and terminal strips shall be color coded or tagged for identification in conformance with the manufacturer’s shop drawings. All control panel wiring shall be protected with a circuit breaker sized in accordance with the cabinet wire size. Provide a service switch.

   Where required by local codes, panels shall be UL rated.

   Provide the following surface mounted devices:
   1. “On-Auto” keyed switch
   2. Overcall switch

3. Relays:
   All relays shall have a visible LED pilot light to indicate relay function.

4. Thermostats/Sensors:
   Provide a wall mounted sensor with application specific DDC control modules mounted at the controlled unit. Controller and remote sensor shall have accessible dial/lever with separate heating and cooling set points, temperature indicator, overcall push button, and JR-45 plug-in jack. Multi-stage A/C units shall have multi-stage control.

   Submit a sensor/thermostat to the owner for review, with the shop drawing submittal.

5. Freezestat:
   Manual reset, 20’ non-averaging (lowest average across one foot). Locate on the entering side of the unit's coil.

6. Overcall Switch:
   Adjustable timer, 0-6 hour span, without hold feature. Timer may be software or mechanical switch.

7. Two-Way Control Valves (Pressure Independent Valves, less than 85 GPM):
   a. The modulating control valves shall be pressure independent.
   b. The pressure independent modulating control valve shall include a pressure compensating cartridge, actuated ball valve, and manual isolation ball in a single valve housing. Control valve shall be ANSI Class IV leakage rate.
   c. Valve body shall consist of forged brass, rated at no less than 360 psi at $250^0$F. Valve body size shall be not more than two pipe sizes smaller than line size.
   d. Valve shall have a fixed end or union end connection with factory installed air vent.
   e. The control valve shall accurately control the flow from 0 to 100% full rated flow with 100 to 1 rangeability and an operating pressure differential range of 6 to 50 psi.
   f. A flow tag shall be furnished with each valve.
   g. A universal mounting plate shall allow installation of actuators meeting the system electrical requirements and valve torque requirements as provided by Belimo, Honeywell, JCI, KMC, Siemens, or Snyder Electric.
   h. The actuator and plate can be rotated after mounting.
   i. Pressure Compensating Cartridge (PCC)
      1. PCC shall automatically compensate for pressure changes in valve and shall maintain a constant pressure drop across the flow limiting actuated ball.
      2. The operating pressure range shall be available with the minimum range requiring 5.8 PSID to 50 psi to actuate the mechanism.
      3. Valve internal control mechanism includes a diaphragm and full travel linear coil spring.
      4. Valves shall include an accessible/replaceable cartridge.
      5. Dual pressure/temperature test valves for verifying the pressure differential across the cartridge and flow limiting ball shall be standard.
   j. Actuated Ball Valve
      1. Valve ball shall consist of chemically plated nickel brass or stainless steel.
      2. Valve shall have a characterized disc of brass or TEFZEL, and with linear characteristic.
      3. Actuator stem shall be removable/replaceable without removing valve from line.
      4. Manufacturer shall be able to provide ball insert to limit flow to maximum flow rate with +/- 5% accuracy.
      5. Valve shall have EPDM O-rings behind the seals to allow for a minimum close-off pressure of 100 psi with 35 in.-lbs. of torque for ½" –2" sizes.
      6. Actuator shall provide minimum torque required for full valve shutoff position.
   k. Isolation Ball Valve
   l. Valve shall include a 600 WOG manual isolation ball valve.
   m. The control valve actuator may be furnished by the controls contractor or by the pressure independent control valve manufacturer. Actuator shall have 100 to 1 resolution. Coordinate actuator characteristics with Building Management system vendor.
   n. At contractor's option, see specification for substitute valves flowing 9.0 GPM or less.

   Specified: Griswold
   Substitute: Flow-Design, Belimo, Siemens, Honeywell

8. Two –Way Control Valves (Pressure Independent Valves, 85 GPM or greater):
   a. Performance:
      1. Pressure Rating, ANSI 125, Class B
      2. Close-off pressure of 100 psig (1378 kPa).
      3. Process Temperature Range: Between 14 deg F to 212 deg F.
   b. Integrated Flow Meter: A characterized control valve shall be integrated with an electronic (ultra-sonic or electromagnetic) flow sensor (accuracy +/- 2%) providing analog flow feedback. The valve shall reposition to maintain the required flow with a +/- 5% accuracy over a pressure differential range of 1 to 50 psig.
   c. Valve shall indicate GPM flow to the Building Management system.

d. Body: Forged brass, nickel plated, ANSI 125 flange. Valve body size shall be not more than two pipe sizes smaller than line size.
e. Ball: Stainless steel
f. Stem and Stem Extension: Stainless steel, blowout-proof design.
g. Ball Seats: Teflon PTFE.
h. Stem Seal: Dual EPDM O-rings (lubricated).
i. Flow Characteristic: Equal percentage.
j. A flow tag shall be furnished with each valve.
k. The control valve actuator may be furnished by the controls contractor or by the pressure independent control valve manufacturer. Actuator shall have 100 to 1 resolution. Coordinate actuator characteristics with Building Management system vendor.

Specified: Belimo ePIV
Substitute: By prior approval

9. Two-way Control Valves (Globe Pattern):
   a. Valve shall have ANSI Class IV leakage rates
   b. Service – Steam pressure below 30 psig and chilled or hot water
   c. Pattern – Globe, single seat
   d. Body – 2 inches and smaller – screwed end brass; 2-1/2 inches and larger – flanged cast iron; 125 psi rating. Valve body size shall be not more than 2 sizes smaller than the line size.
   e. Trim – Bronze with replaceable composition discs on bronze seats; equal percentage modulating plug, 100 to 1 rangeability
   f. Operator –proportional control, 100 to 1 resolution, sufficient torque to provide smooth operation and tight shut-off at 50 psi differential. Operator shall have manual release for manual positioning.

10. Three-way Mixing Control Valve:
    a. Valve shall have ANSI Class IV leakage rate
    b. Service – Chilled water and hot water
    c. Pattern – Globe, Three-way mixing
    d. Body – 2 inches and smaller – screwed end brass; 2-1/2inches and larger – flanged cast iron; 125 psi rating
    e. Trim – Bronze with replaceable composition discs on bronze seats; equal percentage modulating plug, 100 to 1 rangeability
    f. Operator – proportional control, 100 to 1 resolution, sufficient torque to provide smooth operation and tight shut-off at 50 psi differential. Operator shall have manual release for manual positioning

11. Smoke Detector:
    Detector shall be located in the return air stream as required by the International Mechanical Code. Detectors shall be furnished under Div.26, mounted by HVAC contractor. Detector will be interlocked with fire alarm under Div. 26. Interlock wiring to shut down fan shall be HVAC controls responsibility.

12. Damper Operators:
    a. Type – Electric. Operators shall have manual release & manual adjustment. Modulating dampers shall operate with 2-10VDC in 4-20 MA signals.

    b. Size
       1. Low leakage dampers (including face & bypass, relief air, and outdoor air): Minimum 71/2 in- lbs. torque per sq. ft. of damper area.

2. All other dampers: minimum torque as required to overcome damper friction and system air pressure.

3. Installation – Outside ductwork, connected to extended shaft. Furnish with anti-rotation strap and all damper rods, brackets, arms, etc., as required for a rigid mount.

13. Carbon Dioxide Sensor:
Unit shall sense environmental $CO_2$ with a non-dispersive infared sampling method. Unit shall have a 0-2000 ppm range with maximum drift of 75 ppm, 20 ppm repeatability, 5+/- % of reading or 75 ppm accuracy (whichever is greater). Unit output shall be either 0-10VDC or 4-20 ma and with a LED digital display.

Unit shall be Digital Control Systems Model 308 or prior approved equal.

14. Humidity Sensor:
Unit shall have a polymer capacitance sensor unaffected by condensate or high humidity or contaminants. Unit shall have 1-10 VDC output & with short circuit and reverse polarity protection. Unit accuracy shall be 3% +/- over 0-100% RH range. Mounted shall be duct or wall sensing, as indicated on the plans.

Specified: Mamac HU-224/225 Belimo, or prior approved equal.

15. Airflow Measuring:
Sensor probe performance: Accuracy: 2% (duct mounted), 3% (fan inlet); Calibrated range: 0-3000 fpm,
System performance: Installed airflow accuracy 3%-10%; Repeatability – 0.25%

Duct mounted: Ebtron Model #HTX-104-PE or GTX-116-P+ (or prior approved equal)
Fan Inlet: Ebtron Model #HTX-104F (or prior approved equal)

16. Building Pressure Control Sensor: Pressure sensor shall be very low pressure bi-directional thermal dispersion device 4-20 MA and 0-10VDC analog output transmitter. Unit shall have sensitivity to 0.0001 in. wg pressure -0.5” to + 0.5” range, 2% accuracy, 0.25% repeatability.

Specified: Ebtron
Substitute: By prior approval

17. Campus Network and Software:
The new HVAC equipment will be controlled by the owner's existing BMS. The controls contractor shall survey the adequacy of the Owner’s existing front end hardware. Any upgrades required to fully accommodate the new building shall be included in this contract, with no additional cost incurred by the Owner. Owner will provide a data drop at the control panel.

Provide any Menu driven Computer Software necessary to display the building status, system graphics, alarms, trends, and to allow remote access and adjustment of set points and clock functions.

Provide programming time necessary to upgrade the Owner’s existing software to incorporate the new building controls.

18. BMS Alarm Conditions:
The BMS shall indicate, as a minimum, the following alarm conditions to the District facility management system:
    1. Boiler failure (h.w. supply temp.) either of (2)

2. Low or high space temperature (each program zone)
3. Domestic hot water circulator failure (sensed by differential pressure sensor.) Coordinate location with plumbing contractor.

19. DDC control functions, status points, and data points:
    a. VAV Terminals:
        1) Individually addressable from the BMS.
        2) Room temperature set point adjustment from the room sensor or host computer, with assigned authority and with adjustable dead band and throttling range, with over-ride button.
        3) Modulate the primary air valve actuator, actuator position
        4) Fan start/stop, status
        5) Primary air flow CFM, minimum, maximum, set point, adjustment
        6) Sensor plug-in jack for remote communication with a hand held computer, for trouble shooting and test and balance
        7) Discharge temperature
        8) $CO_2$ (where indicated)
        9) Sum total primary airflow for all VAV terminals
        10) Ion Generator status
        11) Relative humidity (where applicable)

    b Air Handling Units (RTU-A)
        1) Fan start/stop status and CFM
        2) Control valve positions (heating water and chilled water) or valve water flow (GPM)
        3) Variable speed drive (where applicable); refer to variable speed drive specifications for addressable points
        4) Supply, return, and mixed air temperature
        5) Filter pressure differentials with alarm at 0.5 in. w.c.(adjustable)
        6) $CO_2$ (where applicable)
        7) Duct static pressure (2 sensors per unit)
        8) Ionization unit status (where applicable)
        9) Outdoor air CFM
        10) Total fan CFM

    c. Relief Fans:
        1) Individually addressable from the BCS.
        2) Variable speed drive. Refer to variable speed drive specifications for addressable points.
        3) Fan CFM
        4) Building pressure.

    d. Boiler Systems:
        1) Boiler start/stop status, each of two (2)
        2) Outdoor air temperature, enthalpy, and relative humidity
        3) Boiler supply and return water temperature, each of two (2)
        4) Hot water supply and return temperature
        5) Hot water or chilled water system leak detection
        6) Boiler efficiency (condensing boilers only)
        7) All points accessible through BacNet Interface

J. Program Control:
The college HVAC equipment shall be programmed to start and stop with the time clock function of the DDC Controller.

Each room sensor override button shall allow only its zone, with VAV terminals and associated equipment to run for one (1) hour. Any occupied zone shall indicate the need for hot water or chilled water to the campus central plant and the appropriate pump, boiler or chiller shall be started.

Each thermostat shall have high and low limit temperature overcall capability and one (1) zone shall have high humidity sensing to overcall the entire wing.

Building Temperature Hold:
Building management system shall have an "On-Auto-Off" building temperature hold software switch to reset unoccupied space temperature set point during extreme cold conditions. During building temperature hold condition, building temperatures shall be maintained at 68°F (adjustable). All exhaust fans and outdoor air units shall be off and outdoor air dampers shall be fully closed. In "Auto" function, building shall enter building temperature hold mode whenever outdoor temperate is below 15°F (adjustable.) After (2) days in the "On" position, the building management system shall send a notification to the district facility management system.

Provide (1) digital output to start/stop domestic hot water circulator. Each circulator shall be energized when its associated zone is occupied. See P-drawings for locations.

K. Sequence of Operations:

1. VAV Air Handling Unit (RTU-A):
   Controls contractor shall provide an applications specific controller for each air handling unit.
   System-off: With the system shutdown, the AHU shall assume the following position:
   1. Return air dampers closed.
   2. Outside air damper closed.
   3. Fan motor “off”.
   4. C.W. and H.W. valve closed.

   a. System Start: AHU shall be started through the clock function of the building controls. The fan start may be delayed through warm-up control.

   b. The cooling function of the AHU shall be dictated by the outside air temperature and central plant chillers status. Above 56°F outside temperature the cooling mode shall be chilled water (if available), otherwise the cooling mode shall be outside air.

   c. C.W. Temperature Control: A duct mounted sensor shall input discharge air temperature to the unit’s DDC controller to maintain setpoint.

      On a rise in temperature above the scheduled cooling L.A.T., the c.w. two-way control valve shall modulate open to maintain temperature.

   d. Outside Air Cooling: When in the outside air cooling mode, the DDC controller shall switch the cooling mode from chilled water to outside air or outside air plus chilled water. The DDC controller shall modulate the outside air and return air dampers as required to maintain discharge air setpoint.

      Return air enthalpy sensing shall allow for simultaneous outside air and chilled water cooling.

      A mixed air temperature sensor shall act as a low limit and not allow the mixed air to drop below 45°F.

   e. Warm-up Control: VAV terminal room sensors shall act as warm-up override sensors and shall not allow the AHU’s fan to energize until the room warms up to heating setpoint.

f. Supply Fan Volume Control: A static pressure sensor/transmitter, located at the far end of the duct run (as indicated on the plans), shall indicate duct pressure to the DDC controller. The DDC controller shall modulate the supply air fan speed to maintain supply air static pressure setpoint. (Initial setpoint shall be 0.5") The static pressure setpoint shall be reset based upon the position of the VAV's supply damper.

The VAV supply damper positions shall be sampled once every 15 minutes. If any damper is open more than 95%, the static pressure setpoint shall be increased by .25 inches. If all dampers are less than 60% open, the static pressure setpoint shall be decreased by .25 inches. The static pressure setpoint shall be limited on the top and bottom ends of the reset schedule. The upper and lower limits shall be determined during onsite testing.

g. Outdoor Air Control:
Demand Controlled Ventilation: RTU control shall work in tandem with VAV terminals for $CO_2$ based demand-controlled ventilation. (See VAV terminal sequence.) Upon rise in $CO_2$ levels above setpoint, and after VAV terminals have been controlled per their sequence to reduce $CO_2$, unit shall modulate outdoor air damper maintain $CO_2$ levels below setpoint. For demand-controlled ventilation controls, the maximum CFM outdoor air shall not exceed the scheduled "ASHRAE Design CFM OA CFM" setting.

Building Pressure Control: BMS shall modulate outdoor air damper to maintain 0.04" (adjustable) differential pressure. Maximum outdoor air CFM shall not exceed scheduled "Design OA CFM" setting.

h. System "Shut Down": The AHU shall return to its "OFF" position on any of the following conditions:
   a. Low temperature as sensed by a freezestat on entering side of cooling coil.
   b. Signal from the DDC Controls System.
   c. Sensing of smoke

2. VAV Terminals (Parallel, Fan Powered):
HVAC Controls contractor shall provide a Belimo damper actuator (or approved equal) for each primary air damper. (Damper actuator shall be factory mounted by the VAV terminal manufacturer.) HVAC controls contractor shall provide an application specific controller for each terminal.

The primary air valve shall be in the normally closed position with the unit "off".

A room sensor shall transmit a proportional signal to the terminal controls. On a rise in temperature, the terminals air valve shall modulate the cooling air flow from 0%-100% and the fan shall remain "off".

On a drop in temperature below set point the primary air valve shall close to its minimum position, and the fan shall be energized. On a continued drop in temperature, the hot water heating valve shall modulate open as required to maintain set point.

Fan Speed Control:
When the primary airflow of the VAV terminal drops below 40% (adjustable) design flow, the BMS shall run the terminal unit's fan at 40% (adjustable) design speed.

The control transformer shall be furnished by the terminal manufacturer. All additional controls shall be provided by the Control Contractor.

The VAV terminal shall shut down (fan off, primary air valve closed) when the VAV terminal's associated air handling unit smoke detector senses smoke.

Demand Control Ventilation (for zones with $CO_2$ sensors):
$CO_2$ sensors shall indicate space $CO_2$ levels to the BCS. On a rise in $CO_2$ above set point the BCS shall increase ventilation air in the following sequence:

a. If the associated terminal primary air flow is less than 35%, the VAV terminal fan shall be energized.

   On a continued rise in $CO_2$ the BCS shall modulate open its associated air handling unit's outdoor air damper. The outdoor air damper shall modulate to the scheduled outdoor air flow rate.

b. If the associated VAV terminal primary air flow is above 35%, the BCS shall modulate open its associated air handling unit's outdoor air damper. The outdoor air damper shall modulate to the scheduled outdoor air flow rate.

3. Boilers and Hot Water Pumps: (CEP)
   New boilers shall be integrated into the buildings existing BMS sequence.

   The boiler control circuits shall be controlled by the DDC staging controller, based on the position of the Heat-Cool-Heat & Cool-Auto switch. With the switch in "Cool" position the boiler shall be locked out. With the switch in the "Heat" or "Heat & Cool" position, the lead boiler shall be energized. With the switch in the "Auto" position the boilers shall be energized whenever any terminal calls for heat. The controller shall have a lead-lag switch programmed for change every 30 days which shall allow altering the boilers lead-lag positions. The lead boiler shall be energized when either an air handling unit or any (3) terminal units call for heat, the heating plant shall be enabled. The lag boiler shall be energized when the hot water set point cannot be maintained with lead boiler only.

   Boiler Pumps shall be electrically interlocked with their associated boiler control circuits. When the boiler is enabled, the pump shall run. After the boiler control circuit is de-energized, its associated boiler pump shall remain on for 30 seconds (adjustable).
   Speed of the boiler pumps shall controlled by the boiler's pumps speed control function, based on the firing rate of the boiler.

   Hot Water Reset: The primary loop hot water supply temperature shall be reset in an inverse proportional relationship to the outside air temperature according to the following schedule:

   | | | |
   |---|---|---|
   | O.A. Temperature | $20^0$F | $60^0$F |
   | Supply Water | $140^0$F | $90^0$F |

   Boiler Emergency Shut Down:
   At each entry/exit door to the boiler room and at each boiler, provide a recessed boiler emergency shut down station with "break glass - push button" operation. For exterior doors, shut down station shall be located just inside the door. Provided a sign noting "BOILER EMERGENCY SHUT DOWN"

4. Existing Hot Water Distribution Pumps (P-1 & P-2)
   Provide an additional differential pressure in the A-Wing hot water piping to indicate pressure to the DDC controller. BMS controller shall base the pump speed to maintain the supply/return minimum differential pressure of the existing building sensors and new A-wing sensor.

5. Existing Building Chilled Water Distribution Pumps (P-3 & P-4)

Provide an additional differential pressure in the A-Wing hot water piping to indicate pressure to the DDC controller. BMS controller shall base the pump speed to maintain the supply/return minimum differential pressure of the existing building sensors and new A-wing sensor.

6. Bi-Polar Ion Generator:
   Provide power wiring and interlock wiring for ionization unit. Provide interlock wiring for each units alarm contact with the BCS. When the units associated fan is started, the ionization unit shall be energized.

7. Relief Air Exhaust Fans (EF-A1 and A2):**Error! Bookmark not defined.**
   Each exhaust fan shall be interlocked with the mode of operation of the associated air handing unit(s) or spaces. For each fan, provide a building pressure control sensor to sense space pressure.
   When the associated unit is in an occupied mode, the exhaust fan motorized damper shall open when the outdoor air to the associated unit reaches 1000 CFM (adjustable) or 0.04" (adjustable) differential pressure. When the outdoor air is greater than 1000 CFM (adjustable) the fan shall energize at its minimum speed and its speed shall be controlled by the building pressure control sensor to maintain less than 0.05" (adjustable) differential pressure in the space.

8. Exhaust Fan EF-B11:
   Fan shall be controlled by wall switch provided by Electrical Division.

9. Existing Hot Water & Chilled Water Pumps: (P-1, P-2, P-3, & P-4):
   Provide new differential pressure sensors on chilled and hot water mains in the A-Wing.
   Incorporate differential pressure readings into the existing variable speed pumping operation.

   Add differential setpoint adjustment to existing pump control sequence:
   The hot and chilled water differential setpoint shall be rest based on valve position. The control valve positions shall be sampled once every 15 minutes. If any valve is open more than 95%, the differential pressure setpoint shall be increased by 5% (adjustable). If all valve position are less than 60% open, the differential pressure setpoint shall be decreased by .5% (adjustable). The differential pressure setpoint shall be limited on the top and bottom ends of the reset schedule. The upper and lower limits shall be determined during onsite testing.

10. Electric Heater (EH-1):
    The heater fan shall be cycle on and off, as required to maintain setpoint. Heater shall have an integral thermostat.

11. Exhaust fan (EF-A3):
    Existing fan replaced.
    Interlock the fan motor starter with the time clock function of the BCS. Provide a relay/contactor in the power circuit of the fan and interlock with a time clock function of the BCS. During building warm-up the exhaust fans shall remain "off".

12. Exhaust fan (EF-D3):
    Existing fan replaced.
    The fan shall be cycled "off" and "on" with a wall thermostat, as required to maintain set point.
    Controls contractor shall provide thermostat and interlock wiring.

TESTING, ADJUSTING, AND BALANCING:
HVAC system testing, adjusting and balancing shall be performed by an independent contractor which specializes in this work. The services required shall include:

1. verification of the performance of all equipment and automatic controls;

2. adjusting and balancing to design quantities of all air and water systems;

3. electrical power readings;

4. recording and reporting all results;

5. Field inspection during the construction phase to insure that balancing valves and dampers are installed where indicated.

6. Provide copies of all T & B site visit Deficiency Reports to the Engineer of Record at the time the report is generated.

Before final acceptance of the building, the balancing contractor shall submit to the Architect/Engineer a bound report of the balancing work containing at least the following items:

1. Schematic diagrams of the A/C systems with the balancing data keyed to the Equipment Data Sheets.

2. Equipment Data Sheets: These records shall be typewritten and submitted on AABC, or SMACNA standard forms. Recorded data shall include at least the following:
   a. Air Systems:
      1. Fan designation, manufacturer, size
      2. Actual and full load nameplate amps (at each terminal for 3 phase units)
      3. Actual and specified fan RPM (or fan speed for variable speed motors.)
      4. Actual and specified total system static pressure
      5. Actual air differential pressure across filters, heating coils, and cooling coils
      6. Actual and specified total system air quantities for supply, return, exhaust, and outside air
      7. Actual and specified air quantities at each terminal: supply, exhaust, and return
      8. Nominal motor H.P., voltage, amp rating, motor overloads size
      9. Fan and drive sheave model no. and make
      10. VFD set point for design air flow
      11. Actual and specified air conditions entering and leaving the heat exchanger coils and heat recovery wheels, for heating and cooling, dehumidification, and hot gas reheat modes
      12. Unit discharge db/wb air temperature in cooling, heating, and dehumdification mode.
      13. Actual and specified kw & delta T's at each electric resistance coil
      14. Actual and specified air volumes at each VAV terminal; for the primary air valve and the fan CFM for fan powered boxes.
      15. Furnish a schematic system diagram for each system and indicate on this sketch, the point of all pressure sensings and duct traverses.
      16. Confirm operation of each needlepoint ionization module by testing ion count 5' above room floor after device (and associated terminal unit) has been running for minimum 5 minutes. Rooms with ion levels below 800 ions/cc may require re-evaluation/retesting. T&B contractor may use owner's ion counter, provided it is returned to the owner in "like new" condition and is fully calibrated.

      Note: 1) Total system air quantities for units 5 ton and larger shall be measured by a duct pitot traverse and not by summation of all terminal air quantities. (Provide duct traverse velocity profile report with T & B report.)
      2) Total system air quantities for units less than 5 tons may be documented by summation of the air terminal quantities.

   b. Water System:

1. Actual and specified pressure and temperature changes across air handlers, heat exchangers, boilers, VAV terminals..
2. Pump designation, manufacturer, impeller size, nominal H.P., voltage, amp rating.
3. Pump actual operating amps and pressure differential.
4. Flow rates for all calibrated orifice flow measuring devices and their associated set points.
5. For pumps provided with variable frequency drives or EC motors:
    a. Set the pump balancing/measuring valve to full open position and set maximum motor speed to achieve design flow rate. Submit motor speed.
    b. Provide pressure differential readings at full flow for each differential pressure sensor. Coordinate readings with HVAC Controls Contractor to use as differential pressure setpoints.
6. Provide flow measurements for calibration of HVAC system flow meters.

c. Existing equipment:
Where indicated on the pump schedule, balnce pumps to new flow rate. Provide full test and balance on pumps for record once modifications have been completed.

d. Air Duct Leakage Test:
Include a certified report indicating the duct leakage for air handling systems where required by the ductwork section of these specifications.

3. A list of the test equipment and instruments used in performing the work.

Necessary software and/or assistance for coordination from the controls contractor shall be provided as noted in the CONTROLS section of these specifications.

All balancing devices shall be marked at their set points.
The hot water and chilled water systems shall have all quantities recorded with the terminal control valves in the open position. (Design Flow)

All air balance at air terminals shall be accomplished by setting branch duct dampers. Diffuser dampers shall be left in the full open position.

Mechanical Contractor shall make available plans and equipment submittals as indicated in the Equipment, General Requirements section of these specifications.

Certification:
The contractor shall submit a written certification signed by a principal of the balancing contractor's firm stating that the environmental systems have been tested, adjusted and balanced to within 10 percent of the design air flow rates.

T & B Balance Contractor shall be any AABC or NEBB certified company.

END OF SECTION

# SECTION 26 01 00 - BASIC ELECTRICAL MATERIALS AND METHODS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes the following:

1. Raceways.
2. Building wire and connectors.
3. Supporting devices for electrical components.
4. Electrical identification.
5. Electricity-metering components.
6. Concrete equipment bases.
7. Electrical demolition.
8. Cutting and patching for electrical construction.
9. Touchup painting.

### 1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. IMC: Intermediate metal conduit.

D. LFMC: Liquidtight flexible metal conduit.

E. RNC: Rigid nonmetallic conduit.

F. GRS: Galvanized Rigid Steel Conduit

### 1.4 SUBMITTALS

A. Product data for each type of component required for project.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.

1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.

B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.

C. Coordinate electrical service connections to components furnished by utility companies.

1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.

D. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

E. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.

PART 2 - PRODUCTS

2.1 RACEWAYS

A. EMT: ANSI C80.3, zinc-coated steel, with compression fittings.

B. FMC: Zinc-coated steel.

C. IMC: ANSI C80.6, zinc-coated steel, with threaded fittings.

D. LFMC: Zinc-coated steel with sunlight-resistant and mineral-oil-resistant plastic jacket.

E. RNC: NEMA TC 2, Schedule 40 PVC, with NEMA TC3 fittings.

F. Raceway Fittings: Specifically designed for the raceway type with which used.

## 2.2 CONDUCTORS

A. Conductors, No. 10 AWG and Smaller: Solid or stranded copper.

B. Conductors, Larger Than No. 10 AWG: Stranded copper.

C. Insulation: Thermoplastic, rated at 75 deg C minimum.

D. Wire Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.

## 2.3 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.

B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.

C. Slotted-Steel Channel Supports: Comply with Division 5 Section "Metal Fabrications" for slotted channel framing.

1. Channel Thickness: Selected to suit structural loading.
2. Fittings and Accessories: Products of the same manufacturer as channel supports.

D. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

F. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

G. Expansion Anchors: Carbon-steel wedge or sleeve type.

H. Toggle Bolts: All-steel springhead type.

I. Powder-Driven Threaded Studs: Heat-treated steel.

## 2.4 ELECTRICAL IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals according to division 26 section 26 05 53.

## 2.5 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

# PART 3 - EXECUTION

## 3.1 ELECTRICAL EQUIPMENT INSTALLATION

A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.

B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

D. Right of Way: Give to raceways and piping systems installed at a required slope.

## 3.2 RACEWAY APPLICATION

A. Use the following raceways for outdoor installations:

1. Exposed: IMC or GRS
2. Concealed: IMC.
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Connection to Vibrating Equipment: LFMC.
6. Boxes and Enclosures: NEMA 250, Type 3R or Type 4.

B. Use the following raceways for indoor installations:

1. Exposed: IMC.
2. Concealed: EMT.
3. Connection to Vibrating Equipment: FMC; except in wet or damp locations, use LFMC.
4. Damp or Wet Locations: IMC.
5. Boxes and Enclosures: NEMA 250, Type 1, unless otherwise indicated.

## 3.3 RACEWAY AND CABLE INSTALLATION

A. Conceal raceways and cables, unless otherwise indicated, within finished walls, ceilings, and floors.

B. Install raceways and cables at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Locate horizontal raceway runs above water and steam piping.

C. Use temporary raceway caps to prevent foreign matter from entering.

D. Make conduit bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

E. Use raceway and cable fittings compatible with raceways and cables and suitable for use and location.

F. Install raceways embedded in slabs in middle third of slab thickness where practical, and leave at least 1-inch concrete cover.

1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
2. Space raceways laterally to prevent voids in concrete.
3. Install conduit larger than 1-inch trade size parallel to or at right angles to main reinforcement. Where conduit is at right angles to reinforcement, place conduit close to slab support.
4. Make bends in exposed parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for exposed parallel raceways.

G. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of the pull wire.

H. Install telephone and signal system raceways, 2-inch trade size and smaller, in maximum lengths of 150 feet and with a maximum of two 90-degree bends or

equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements, in addition to requirements above.

I. Connect motors and equipment subject to vibration, noise transmission, or movement with a maximum of 72-inch flexible conduit. Install LFMC in wet or damp locations. Install separate ground conductor across flexible connections.

## 3.4 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

A. Feeders: **Type THHN/THWN insulated conductors in raceway.**

B. Underground Feeders and Branch Circuits: Type THWN or single-wire, Type UF insulated conductors in raceway.

C. Branch Circuits: Type THHN/THWN insulated conductors in raceway.

D. Branch Circuits: Type THW or THHN/THWN insulated conductors in raceway.

E. Remote-Control Signaling and Power-Limited Circuits: Type THHN/THWN insulated conductors in raceway for Classes 1, 2, and 3, unless otherwise indicated.

## 3.5 WIRING INSTALLATION

A. Install splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.

B. Install wiring at outlets with at least 12 inches of slack conductor at each outlet.

C. Connect outlet and component connections to wiring systems and to ground. Tighten electrical connectors and terminals, according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

## 3.6 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.

B. Dry Locations: Steel materials.

C. Support Clamps for PVC Raceways: Click-type clamp system.

D. Selection of Supports: Comply with manufacturer's written instructions.

E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb design load.

3.7 SUPPORT INSTALLATION

A. Install support devices to securely and permanently fasten and support electrical components.

B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.

E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

F. Install 1/4-inch diameter or larger threaded steel hanger rods, unless otherwise indicated.

G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channels and angle supports.

H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

I. Simultaneously install vertical conductor supports with conductors.

J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.

K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.

L. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

M. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:

1. Wood: Fasten with wood screws or screw-type nails.
2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
3. New Concrete: Concrete inserts with machine screws and bolts.
4. Existing Concrete: Expansion bolts.
5. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete.
6. Steel: Welded threaded studs or spring-tension clamps on steel.

    a. Field Welding: Comply with AWS D1.1.

7. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
8. Light Steel: Sheet-metal screws.
9. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

## 3.8 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. Remove demolished material from Project site.

E. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

## 3.9 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been

disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

## 3.10 FIELD QUALITY CONTROL

A. Inspect installed components for damage and faulty work, including the following:

1. Raceways.
2. Building wire and connectors.
3. Supporting devices for electrical components.
4. Electrical identification.
5. Electricity-metering components.
6. Concrete bases.
7. Electrical demolition.
8. Cutting and patching for electrical construction.
9. Touchup painting.

## 3.11 REFINISHING AND TOUCHUP PAINTING

A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 9 Section "Painting."

1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

## 3.12 CLEANING AND PROTECTION

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 26 01 00

# SECTION 26 05 19 - CONDUCTORS AND CABLES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

### 1.3 SUBMITTALS

A. Product Data: For each type of conductors and cable as required for project.

### 1.4 QUALITY ASSURANCE

A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

B. Comply with NFPA 70.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver wires and cables according to NEMA WC 26.

### 1.6 COORDINATION

A. Coordinate layout and installation of cables with other installations.

B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Architect.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wires and Cables:

   a. Alcan Aluminum Corporation; Alcan Cable Div.
   b. American Insulated Wire Corp.; Leviton Manufacturing Co.
   c. BICC Brand-Rex Company.
   d. Carol Cable Co., Inc.
   e. Senator Wire & Cable Company.
   f. Southwire Company.

2. Connectors for Wires and Cables:

   a. AMP Incorporated.
   b. General Signal; O-Z/Gedney Unit.
   c. Square D Co.; Anderson.
   d. 3M Company; Electrical Products Division.

### 2.2 BUILDING WIRES AND CABLES

A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Wire and Insulation Applications" Article.

B. Rubber Insulation Material: Comply with NEMA WC 3.

C. Thermoplastic Insulation Material: Comply with NEMA WC 5.

D. Cross-Linked Polyethylene Insulation Material: Comply with NEMA WC 7.

E. Ethylene Propylene Rubber Insulation Material: Comply with NEMA WC 8.

F. Conductor Material: Copper.

G. Stranding: Stranded conductor for larger than No. 10 AWG.

## 2.3 CONNECTORS AND SPLICES

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

# PART 3 – EXECUTION

## 3.1 EXAMINATION

A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

## 3.2 WIRE AND INSULATION APPLICATIONS

A. Service Entrance: Type RHW or THWN, in raceway.

B. Feeders: Type THHN/THWN, in raceway.

C. Fire-Pump Feeder: Type THHN/THWN, in raceway concrete encased.

D. Branch Circuits: Type THHN/THWN, in raceway.

E. Fire Alarm Circuits: Type THHN/THWN, in raceway.

F. Class 1 Control Circuits: Type THHN/THWN, in raceway.

G. Class 2 Control Circuits: Type THHN/THWN, in raceway.

## 3.3 INSTALLATION

A. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."

B. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Identify wires and cables according to Division 26 Section "Electrical Identification."

3.4 CONNECTIONS

A. Conductor Splices: Keep to minimum.

B. Install splices and tapes that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.

C. Use splice and tap connectors compatible with conductor material.

D. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

E. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.

F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 26 05 19

# SECTION 26 05 26 - GROUNDING

## PART 1 – GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes grounding of electrical systems and equipment and basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other Sections of these Specifications.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 26 Section "Conductors and Cables" for requirements for grounding conductors.

### 1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data: For grounding rods, connectors and connection materials, and grounding fittings.

### 1.4 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. Comply with UL 467.

C. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Apache Grounding; Nashville Wire Products.
2. Boggs: H. L. Boggs & Co.
3. Chance: A. B. Chance Co.
4. Dossert Corp.
5. Erico Inc.; Electrical Products Group.
6. Galvan Industries, Inc.
7. Hastings Fiber Glass Products, Inc.
8. Heary Brothers Lightning Protection Co.
9. Ideal Industries, Inc.
10. ILSCO.
11. Kearney.
12. Korns: C. C. Korns Co.
13. Lightning Master Corp.
14. Lyncole XIT Grounding.
15. O-Z/Gedney Co.
16. Raco, Inc.
17. Salisbury: W.H. Salisbury & Co., Utility.
18. Thomas & Betts, Electrical.
19. Utilco Co.

### 2.2 GROUNDING AND BONDING PRODUCTS

A. Governing Requirements: Where types, sizes, ratings, and quantities indicated are in excess of National Electrical Code (NEC) requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

### 2.3 WIRE AND CABLE GROUNDING CONDUCTORS

A. Comply with Division 26 Section "Conductors and Cables." Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.

B. Equipment Grounding Conductors: Insulated with green color insulation.

C. Grounding-Electrode Conductors: Stranded cable.

D. Underground Conductors: Bare, tinned, stranded, except as otherwise indicated.

E. Bare Copper Conductors: Conform to the following:

1. Solid Conductors: ASTM B 3.
2. Assembly of Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

## 2.4 MISCELLANEOUS CONDUCTORS

A. Grounding Bus: Bare, annealed-copper bars of rectangular cross section.

B. Braided Bonding Jumpers: Copper tape, braided No. 30 AWG bare copper wire, terminated with copper ferrules.

C. Bonding Straps: Soft copper, 0.05 inch thick and 2 inches wide, except as indicated.

## 2.5 CONNECTOR PRODUCTS

A. Pressure Connectors: High-conductivity-plated units.

B. Bolted Clamps: Heavy-duty type.

C. Exothermic-Welded Connections: Provided in kit form and selected per manufacturer's written instructions for specific types, sizes, and combinations of conductors and connected items.

## 2.6 GROUNDING ELECTRODES AND TEST WELLS

A. Grounding Rods: Sectional type; copper-clad steel.

1. Size: 3/4 inch by 10 feet.

B. Test Wells: Fabricate from 15-inch long, square-cut sections of 8-inch diameter, Schedule 80, PVC pipe.

# PART 3 - EXECUTION

## 3.1 APPLICATION

A. Equipment Grounding Conductors: Comply with NEC Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.

1. Install equipment grounding conductor with circuit conductors for all circuits.

B. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide a No. 4 AWG minimum insulated grounding conductor in raceway from grounding-electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch grounding bus.
2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

C. Metal Poles Supporting Outdoor Lighting Fixtures: Ground pole to a grounding electrode in addition to separate equipment grounding conductor run with supply branch circuit.

## 3.2 INSTALLATION

A. General: Ground electrical systems and equipment according to NEC requirements, except where Drawings or Specifications exceed NEC requirements.

B. Electrical Room Grounding Bus: Space 1 inch from wall and support from wall 6 inches above finished floor, except as otherwise indicated.

C. Grounding Rods: Locate a minimum of 1-rod length from each other and at least the same distance from any other grounding electrode.

1. Drive until tops are 2 inches below finished floor or final grade, except as otherwise indicated.
2. Interconnect with grounding-electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make these connections without damaging copper coating or exposing steel.

D. Grounding Conductors: Route along the shortest and straightest paths possible, except as otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

E. Underground Grounding Conductors: Use bare copper wire. Bury at least 24 inches below grade.

F. Metal Water Service Pipe: Provide insulated copper grounding conductors, sized as indicated, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding-clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Do not install a grounding jumper across dielectric fittings. Bond grounding-conductor conduit to conductor at each end.

G. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding-clamp connectors.

## 3.3 CONNECTIONS

A. General: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells. Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as otherwise indicated.

E. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.

F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

G. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

## 3.4 FIELD QUALITY CONTROL

A. Tests: Subject the completed grounding system to a megger test at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than 2 full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by the 2-point method according to IEEE 81.

B. Maximum grounding to resistance values are as follows:

1. Equipment Rated 500 kVA and Less: 10 ohms.

C. Excessive Ground Resistance: Where resistance to ground exceeds specified values, notify Owner promptly and include recommendations to reduce ground resistance and to accomplish recommended work.

D. Report: Prepare test reports of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

## 3.5 ADJUSTING AND CLEANING

A. Restore surface features, including vegetation, at areas disturbed by work of this Section. Reestablish original grades, except as otherwise indicated. Where sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Division 32 Section "Landscaping." Maintain restored surfaces. Restore disturbed paving as indicated.

END OF SECTION 26 05 26

# SECTION 26 05 29 - WIRING DEVICES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes receptacles, connectors, switches, and finish plates.

### 1.3 DEFINITIONS

A. G: Ground-fault circuit interrupter.

B. IG: Isolated Ground Conductor

### 1.4 SUBMITTALS

A. Product Data: For each product specified.

B. Shop Drawings: Legends for receptacles and switch plates.

### 1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

B. Comply with NEMA WD 1.

C. Comply with NFPA 70.

### 1.6 COORDINATION

A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1. Cord and Plug Sets: Match equipment requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wiring Devices:

a. Hubbell, Inc.; Wiring Devices Div.
b. Leviton Manufacturing Co., Inc.
c. Pass & Seymour/Legrand; Wiring Devices Div.
d. Pyle-National, Inc.; an Amphenol Co.
e. Eagle Electric Manufacturing Co., Inc.

### 2.2 RECEPTACLES

A. Straight-Blade Receptacles: Heavy-Duty grade.
Type 5-20R, Plastic Face, coordinate finish with architect.

B. GFCI Receptacles: Feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a 2-3/4-inch deep outlet box without an adapter.

C. Isolated Ground Receptacles: Finish color with orange IG triangle on the face of the receptacle.

### 2.3 CORD AND PLUG SETS

A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.

1. Cord: Rubber-insulated, stranded-copper conductors, with type SOW-A jacket. Green-insulated grounding conductor, and equipment-rating ampacity plus a minimum of 30 percent.
2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

### 2.4 SWITCHES

A. Snap Switches: Heavy-duty, quiet type rated 20 amperes, 120/277 V. AC. Handle: Plastic, coordinate finish with architect.

B. Keyed Type: Hubbell 96061, Furnish 3 keys.

## 2.5 WALL PLATES

A. Single and combination types match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: 0.04-inch thick, Type 302, satin-finished stainless steel. Coordinate finish with architect.
3. Material for Unfinished Spaces: Galvanized steel.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

A. Install devices and assemblies plumb and secure.

B. Install wall plates when painting is complete.

C. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

D. Protect devices and assemblies during painting.

## 3.2 IDENTIFICATION

A. Comply with Division 26 Section "Electrical Identification."

## 3.3 CONNECTIONS

A. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor.

B. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

## 3.4 FIELD QUALITY CONTROL

A. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.

B. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

C. Replace damaged or defective components.

## 3.5 CLEANING

A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 26 05 29

# SECTION 26 05 33 - RACEWAYS AND BOXES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1. Raceways include the following:

a. RMC.
b. IMC.
c. EMT.
d. FMC.
e. LFMC.
f. RNC.
g. Wireways.
h. Surface raceways.

2. Boxes, enclosures, and cabinets include the following:

a. Device boxes.
b. Outlet boxes.
c. Pull and junction boxes.
d. Cabinets and hinged-cover enclosures.

B. Related Sections include the following:

1. Division 26 Section "Basic Electrical Materials and Methods" for raceways and box supports.
2. Division 26 Section "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

### 1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.
B. FMC: Flexible metal conduit.
C. IMC: Intermediate metal conduit.
D. LFMC: Liquidtight flexible metal conduit.

E. RMC: Rigid metal conduit.
F. RNC: Rigid nonmetallic conduit.

## 1.4 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: Include layout drawings showing components and wiring for nonstandard boxes, enclosures, and cabinets.

## 1.5 QUALITY ASSURANCE

A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

B. Comply with NECA's "Standard of Installation."

C. Comply with NFPA 70.

## 1.6 COORDINATION

A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Metal Conduit and Tubing:

a. Alflex Corp.
b. Anamet, Inc.; Anaconda Metal Hose.
c. Anixter Brothers, Inc.
d. Carol Cable Co., Inc.
e. Cole-Flex Corp.
f. Electri-Flex Co.

g. Flexcon, Inc.; Coleman Cable Systems, Inc.
h. Grinnell Co.; Allied Tube and Conduit Div.
i. Monogram Co.; AFC.
j. Spiraduct, Inc.
k. Triangle PWC, Inc.
l. Wheatland Tube Co.

2. Nonmetallic Conduit and Tubing:

a. Anamet, Inc.; Anaconda Metal Hose.
b. Arnco Corp.
c. Breeze-Illinois, Inc.
d. Cantex Industries; Harsco Corp.
e. Certainteed Corp.; Pipe & Plastics Group.
f. Cole-Flex Corp.
g. Condux International; Electrical Products.
h. Electri-Flex Co.
i. George-Ingraham Corp.
j. Hubbell, Inc.; Raco, Inc.
k. Lamson & Sessions; Carlon Electrical Products.
l. R&G Sloan Manufacturing Co., Inc.
m. Spiraduct, Inc.
n. Thomas & Betts Corp.

3. Conduit Bodies and Fittings:

a. American Electric; Construction Materials Group.
b. Crouse-Hinds; Div. of Cooper Industries.
c. Emerson Electric Co.; Appleton Electric Co.
d. Hubbell, Inc.; Killark Electric Manufacturing Co.
e. Lamson & Sessions; Carlon Electrical Products.
f. O-Z/Gedney; Unit of General Signal.
g. Scott Fetzer Co.; Adalet-PLM.
h. Spring City Electrical Manufacturing Co.

4. Metal Wireways:

a. Hoffman Engineering Co.
b. Keystone/Rees, Inc.
c. Square D Co.

5. Nonmetallic Wireways:

a. Hoffman Engineering Co.
b. Lamson & Sessions; Carlon Electrical Products.

6. Surface Metal Raceways:

a. American Electric; Construction Materials Group.

b. Butler Manufacturing Co.; Walker Division.
c. Wiremold Co. (The); Electrical Sales Division.

7. Surface Nonmetallic Raceways:

a. Anixter Brothers, Inc.
b. Butler Manufacturing Co.; Walker Division.
c. Hubbell, Inc.; Wiring Device Division.
d. JBC Enterprises, Inc.; Enduro Fiberglass Systems.
e. Lamson & Sessions; Carlon Electrical Products.
f. Panduit Corp.
g. Thermotools Co.
h. United Telecom; Premier Telecom Products, Inc.
i. Wiremold Co. (The); Electrical Sales Division.

8. Boxes, Enclosures, and Cabinets:

a. American Electric; FL Industries.
b. Butler Manufacturing Co.; Walker Division.
c. Crouse-Hinds; Div. of Cooper Industries.
d. Electric Panelboard Co., Inc.
e. Erickson Electrical Equipment Co.
f. Hoffman Engineering Co.; Federal-Hoffman, Inc.
g. Hubbell Inc.; Killark Electric Manufacturing Co.
h. Hubbell Inc.; Raco, Inc.
i. Lamson & Sessions; Carlon Electrical Products.
j. O-Z/Gedney; Unit of General Signal.
k. Parker Electrical Manufacturing Co.
l. Robroy Industries, Inc.; Electrical Division.
m. Scott Fetzer Co.; Adalet-PLM.
n. Spring City Electrical Manufacturing Co.
o. Thomas & Betts Corp.
p. Woodhead Industries, Inc.; Daniel Woodhead Co.

## 2.2 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: ANSI C80.1.

B. IMC: ANSI C80.6.

C. EMT and Fittings: ANSI C80.3.

1. Fittings: Compression type.

D. FMC: Zinc-coated steel.

E. LFMC: Flexible steel conduit with PVC jacket.

F. Fittings: NEMA FB 1; compatible with conduit/tubing materials.

## 2.3 NONMETALLIC CONDUIT AND TUBING

A. RNC: NEMA TC 2, Schedule 40 or 80 PVC.

B. RNC Fittings: NEMA TC 3; match to conduit type and material.

## 2.4 METAL WIREWAYS

A. Material: Sheet metal sized and shaped as indicated.

B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

D. Wireway Covers: As indicated

E. Finish: Manufacturer's standard enamel finish.

## 2.5 NONMETALLIC WIREWAYS

A. Description: Fiberglass polyester, extruded and fabricated to size and shape indicated, with no holes or knockouts. Cover is gasketed with oil-resistant gasket material and fastened with captivated screws treated for corrosion resistance. Connections are flanged, with stainless-steel screws and oil-resistant gaskets.

B. Description: PVC plastic, extruded and fabricated to size and shape indicated, with snap-on cover and mechanically coupled connections using plastic fasteners.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

## 2.6 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.

B. Surface Nonmetallic Raceways: 2-piece construction, manufactured of rigid PVC compound with matte texture and manufacturer's standard color.

C. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.7 OUTLET AND DEVICE BOXES

A. Sheet Metal Boxes: NEMA OS 1.

B. Cast-Metal Boxes: NEMA FB 1, Type FD, cast box with gasketed cover.

2.8 PULL AND JUNCTION BOXES

A. Small Sheet Metal Boxes: NEMA OS 1.

B. Cast-Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover.

2.9 ENCLOSURES AND CABINETS

A. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.

B. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage, and include accessory feet where required for freestanding equipment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRING METHODS

A. Outdoors: Use the following wiring methods:

1. Exposed: Rigid steel or IMC.
2. Concealed: Rigid steel or IMC.
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Boxes and Enclosures: NEMA 250, Type 3R or Type 4.

B. Indoors: Use the following wiring methods:

1. Exposed: IMC or Rigid Steel.
2. Concealed: EMT.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric. Solenoid, or Motor-Driven Equipment): FMC; except in wet or damp locations, use LFMC.
4. Damp or Wet Locations: Rigid steel conduit.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:

a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

## 3.3 INSTALLATION

A. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.

B. Minimum Raceway Size: 3/4-inch trade size.

C. Conceal conduit and EMT, unless otherwise indicated, within finished walls, ceilings, and floors.

D. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

E. Install raceways level and square and at proper elevations. Provide adequate headroom.

F. Complete raceway installation before starting conductor installation.

G. Support raceways as specified in Division 26 Section "Basic Electrical Materials and Methods."

H. Use temporary closures to prevent foreign matter from entering raceways.

I. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.

J. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

K. Use raceway fittings compatible with raceways and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.

L. Run concealed raceways, with a minimum of bends, in the shortest practical distance considering the type of building construction and obstructions, unless otherwise indicated.

M. Raceways Embedded in Slabs: Install in middle third of slab thickness where practical, and leave at least 1-inch concrete cover.

1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
2. Space raceways laterally to prevent voids in concrete.
3. Run conduit larger than 1-inch trade size parallel to or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.

N. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.

1. Run parallel or banked raceways together, on common supports where practical.
2. Make bends in parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

O. Join raceways with fittings designed and approved for the purpose and make joints tight.

1. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
2. Use insulating bushings to protect conductors.

P. Terminations: Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against the box. Where terminations are not secure with 1 locknut, use 2 locknuts: 1 inside and 1 outside the box.

Q. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.

R. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of the pull wire.

S. Telephone and Signal System Raceways, 2-Inch Trade Size and Smaller: In addition to the above requirements, install raceways in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

T. Install raceway sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as the boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

U. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with the finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded flush plugs flush with floor for future equipment connections.

V. Flexible Connections: Use maximum of 6 feet of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquidtight flexible conduit in wet or damp locations. Install separate ground conductor across flexible connections.

W. Do not install aluminum conduits embedded in or in contact with concrete.

X. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

## 3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

## 3.5 CLEANING

A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 26 05 33

# SECTION 26 05 53 - ELECTRICAL IDENTIFICATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes electrical identification materials and devices required to comply with ANSI C2, NFPA 70, OSHA standards, and authorities having jurisdiction.

### 1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Schedule of Nomenclature: An index of electrical equipment and system components used in identification signs and labels.

C. Samples: For each type of label and sign to illustrate color, lettering style, and graphic features of identification products.

### 1.4 QUALITY ASSURANCE

A. Comply with ANSI C2.

B. Comply with NFPA 70.

C. Comply with ANSI A13.1 and NFPA 70 for color-coding.

## PART 2 - PRODUCTS

### 2.1 RACEWAY AND CABLE LABELS

A. Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

1. Color: Black letters on orange field.
2. Legend: Indicates **voltage.**

B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl with legend overlaminated with a clear, weather- and chemical-resistant coating.

C. Pretensioned, Wraparound Plastic Sleeves: Flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the line it identifies and arranged to stay in place by pretensioned gripping action when placed in position.

D. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

E. Underground-Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape.

1. Not less than 6 inches wide by 4 mils thick.
2. Compounded for permanent direct-burial service.
3. Embedded continuous metallic strip or core.
4. Printed legend indicating type of underground line.

F. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

G. Aluminum, Wraparound Marker Bands: Bands cut from 0.014-inch thick aluminum sheet, with stamped or embossed legend, and fitted with slots or ears for permanently securing around wire or cable jacket or around groups of conductors.

H. Plasticized Card-Stock Tags: Vinyl cloth with preprinted and field-printed legends. Orange background, unless otherwise indicated, with eyelet for fastener.

I. Aluminum-Faced, Card-Stock Tags: Weather-resistant, 18-point minimum card stock faced on both sides with embossable aluminum sheet, 0.002 inch thick, laminated with moisture-resistant acrylic adhesive, punched for fasteners, and preprinted with legends to suit each application.

J. Brass or Aluminum Tags: 2 by 2 by 0.05-inch metal tags with stamped legend, punched for fastener.

## 2.2 NAMEPLATES AND SIGNS

A. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.

B. Engraved Plastic Nameplates and Signs: Engraving stock, melamine plastic laminate, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.

C. Baked-Enamel Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for the application. 1/4-inch grommets in corners for mounting.

D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for the application. 1/4-inch grommets in corners for mounting.

E. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32, stainless-steel machine screws with nuts and flat and lock washers.

## 2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch.
2. Tensile Strength: 50 lb minimum.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: According to color-coding.

B. Paint: Formulated for the type of surface and intended use.

1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.
2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.
3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.
4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.

C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before applying.

E. Color Banding Raceways and Exposed Cables: Band exposed and accessible raceways of the systems listed below:

1. Bands: Pretensioned, wraparound plastic sleeves; colored adhesive tape; or a combination of both. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
3. Apply the following colors to the systems listed below:

    a. Fire Alarm System: Red.
    b. Fire-Suppression Supervisory and Control System: Red and yellow.
    c. Combined Fire Alarm and Security System: Red and blue.
    d. Security System: Blue and yellow.
    e. Mechanical and Electrical Supervisory System: Green and blue.
    f. Telecommunication System: Green and yellow.

F. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

G. Circuit Identification Labels on Boxes: Install labels externally.

1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on cover.
2. Concealed Boxes: Plasticized card-stock tags.
3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.

H. Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above line at 6 to 8 inches below finished grade. Where width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches overall, use a single line marker. **Install line marker for underground wiring, both direct-buried cables and cables in raceway**.

I. Secondary Service, Feeder, and Branch-Circuit Conductors: Color-code throughout the secondary electrical system.

1. Color-code 208/120-V system as follows:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.
d. Neutral: White.
e. Ground: Green.

2. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:

a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch- wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.

J. Power-Circuit Identification: Metal tags or aluminum, wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.

1. Legend: 1/4-inch steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
2. Tag Fasteners: Nylon cable ties.
3. Band Fasteners: Integral ears.

K. Apply identification to conductors as follows:

1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
3. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.

L. Apply warning, caution, and instruction signs as follows:

1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where

instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

M. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch high lettering on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:

1. Panelboards, electrical cabinets, and enclosures.
2. Access doors and panels for concealed electrical items.
3. Disconnect switches.
4. Motor starters.
5. Control devices.
6. Fire alarm master station or control panel.

END OF SECTION 26 05 53

# SECTION 26 24 16 - PANELBOARDS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V and less.

B. Related Sections include the following:

1. Division 26 Section "Basic Electrical Materials and Methods" for general materials and installation methods.
2. Division 26 Section "Electrical Identification" for labeling materials.

### 1.3 SUBMITTALS

A. Product Data: For each type of panelboard, accessory item, and component specified.

B. Shop Drawings: For panelboards. Include dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:

1. Enclosure type with details for types other than NEMA 250, Type 1.
2. Bus configuration and current ratings.
3. Short-circuit current rating of panelboard.
4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
5. Wiring Diagrams: Details of schematic diagram including control wiring and differentiating between manufacturer-installed and field-installed wiring.

C. Maintenance Data: For panelboard components to include in the maintenance manuals specified in Division 1. Include manufacturer's written instructions for testing circuit breakers.

### 1.4 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

B. Comply with NFPA 70.

C. Comply with NEMA PB 1.

1.5 EXTRA MATERIALS

A. Keys: 2 spares of each type for panelboard cabinet lock.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Square D Company
2. Cuttler Hammer
3. G.E.

2.2 PANELBOARD FABRICATION

A. Enclosures: Flush- or surface-mounted cabinets as indicated. NEMA PB 1, Type 1, unless otherwise indicated to meet environmental conditions at installed location.

B. Front: Secured to box with concealed trim clamps, unless otherwise indicated. Front for surface-mounted panelboards shall be same dimensions as box. Fronts for flush panelboards shall overlap box, unless otherwise indicated.

C. Directory Frame: Metal, mounted inside each panelboard door.

D. Bus: Hard drawn copper of 98 percent conductivity.

E. Main and Neutral Lugs: 1200A Panelboard - Compression type.
Remaining panelboards - Mechanical lugs

F. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.

G. Service Equipment Approval: Listed for use as service equipment for panelboards with main service disconnect.

H. Future Devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for the overcurrent protective device ampere ratings indicated for future installation of devices.

I. Special Features: Include the following features for panelboards as indicated:

1. Hinged Front Cover: Entire front trim hinged to box with standard door within hinged trim cover.

## 2.3 LOAD CENTERS

A. Overcurrent Protective Devices: Plug-in, full-module circuit breaker.

1. Circuit Breakers for Switching Lights at Panelboards: Indicated as Type SWD.
2. Circuit Breakers for Equipment Marked Type HACR: Indicated as Type HACR.

B. Conductor Connectors: Mechanical type for main, neutral, and ground lugs and buses.

## 2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: In panelboard front, with concealed hinges. Secure with flush catch and tumbler lock, all keyed alike.

## 2.5 DISTRIBUTION PANELBOARDS

A. Doors: In panelboard front, unless otherwise indicated. Secure door with vault-type latch with tumbler lock, all keyed alike.

B. Branch-Circuit Breakers: Where overcurrent protective devices are indicated to be circuit breakers, use bolt-on circuit breakers, except circuit breakers 225-A frame size and greater may be plug-in type where individual positive-locking device requires mechanical release for removal.

## 2.6 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable.

1. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting capacity rating to meet available fault current.
2. Application Listing: Appropriate for application, including Type SWD for switching fluorescent lighting loads and Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Circuit Breakers, 200 A and Larger: Trip units interchangeable within frame size.
4. Circuit Breakers, 400 A and Larger: Field-adjustable short-time and continuous current settings.

5. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated. 1200A. panelboard shall have compression lugs.
6. Shunt Trip: Where indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Install panelboards and accessory items according to NEMA PB 1.1.

B. Mounting Heights: Top of trim 74 inches above finished floor, unless otherwise indicated.

C. Mounting: Plumb and rigid without distortion of box. Mount flush panelboards uniformly flush with wall finish.

D. Circuit Directory: Type directory to indicate installed circuits.

E. Install filler plates in unused spaces.

F. Provision for Future Circuits at Flush Panelboards: Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

G. Wiring in Panelboard Gutters: Arrange conductors into groups, and bundle and wrap with wire ties after completing load balancing.

### 3.2 IDENTIFICATION

A. Identify field-installed wiring and components and provide warning signs as specified in Division 26 Section "Electrical Identification."

B. Panelboard Nameplates: Label each panelboard with engraved laminated-plastic or metal nameplates mounted with corrosion-resistant screws.

### 3.3 GROUNDING

A. Make equipment grounding connections for panelboards as indicated.

B. Provide ground continuity to main electrical ground bus as indicated.

## 3.4 CONNECTIONS

A. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

## 3.5 FIELD QUALITY CONTROL

A. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units, and retest.

B. ADJUSTING

1. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

## 3.7 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION 26 24 16

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# SECTION 26 28 16 - DISCONNECT SWITCHES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes individually mounted switches and circuit breakers used for the following:

1. Motor disconnect switches.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 26 Section "Wiring Devices" for attachment plugs and receptacles, and snap switches used for disconnect switches.

### 1.3 SUBMITTALS

A. Product Data for disconnect switches and accessories specified in this Section.

### 1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain disconnect switches and circuit breakers from one source and by a single manufacturer.

B. Comply with NFPA 70 for components and installation.

C. Listing and Labeling: Provide disconnect switches and circuit breakers specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide disconnect switches by one of the following:

1. Square D
2. General Electric
3. Siemens
4. Eaton

2.2 DISCONNECT SWITCHES

A. Enclosed, Nonfusible Switch: NEMA KS 1, Type HD, with lockable handle.

B. Enclosure: NEMA KS 1, Type 1, unless otherwise specified or required to meet environmental conditions of installed location.

1. Outdoor Locations: Type 3R.
2. Other Wet or Damp Indoor Locations: Type 4.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install disconnect switches in locations as indicated, according to manufacturer's written instructions.

B. Install disconnect switches level and plumb.

C. Connect disconnect switches to wiring system and to ground as indicated and instructed by manufacturer.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

D. Identify each disconnect switch according to requirements specified in Division 26 Section "Electrical Identification."

3.2 FIELD QUALITY CONTROL

A. Testing: After installing disconnect switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

B. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

## 3.3 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

END OF SECTION 26 28 16

# SECTION 26 51 00 - INTERIOR LIGHTING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes interior lighting fixtures, lighting fixtures mounted on exterior building surfaces, lamps, ballasts, emergency lighting units, and accessories.

### 1.3 SUBMITTALS

A. Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:

1. Dimensions of fixtures.
2. Certified results of independent laboratory tests for fixtures and lamps for electrical ratings and photometric data.
3. Emergency lighting unit battery and charger.
4. Types of lamps.
5. LED driver type with AC input wattage

B. Shop Drawings: Show details of nonstandard or custom fixtures. Indicate dimensions, weights, method of field assembly, components, features, and accessories.

1. Wiring Diagrams: Detail wiring for fixtures and differentiate between manufacturer-installed and field-installed wiring.

C. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1.

### 1.4 QUALITY ASSURANCE

A. Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

B. Comply with NFPA 70.

C. Comply with ICC series of codes.

## 1.5 COORDINATION

A. Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.

## 1.6 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty for Batteries: Written warranty, executed by manufacturer agreeing to replace rechargeable batteries that fail in materials or workmanship within specified warranty period.

1. Special Warranty Period for Batteries: Manufacturer's standard, but not less than 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for last nine years.

C. Special Warranties for LED drivers: Written warranty, executed by manufacturer agreeing to replace LED drivers that fail in materials or workmanship within specified warranty period

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Lighting Fixture Schedule on drawings.

## 2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

A. Metal Parts: Free from burrs, sharp corners, and edges.

B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.

D. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.
4. Laminated Silver Metallized Film: 90 percent.

E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.

1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.
2. Lens Thickness: 0.125 inch minimum, unless greater thickness is indicated.

## 2.5 EXIT SIGNS

A. General Requirements: Comply with UL 924 and the following:

1. Sign Colors and Lettering Size: Comply with authorities having jurisdiction.

B. Internally Lighted Signs: As follows:

1. Lamps for AC Operation: Light-emitting diodes, 70,000 hours minimum rated lamp life.

## 2.6 LAMPS

A. LED Color Temperature and Minimum Color-Rendering Index: 3500 K and 80 CRI, unless otherwise indicated.

## 2.7 FIXTURE SUPPORT COMPONENTS

A. Comply with Division 26 Section "Basic Electrical Materials and Methods," for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy arranged to mount a single fixture. Finish same as fixture.

D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

E. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

F. Aircraft Cable Support: Use cable, anchorages, and intermediate supports recommended by fixture manufacturer.

## 2.8 FINISHES

A. Fixtures: Manufacturer's standard, unless otherwise indicated.

1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
2. Metallic Finish: Corrosion resistant.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.

B. Support for Fixtures in or on Grid-Type Suspended Ceilings: Use grid for support.

1. Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches from fixture corners.
2. Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner.
3. Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.

C. Suspended Fixture Support: As follows:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.

D. Recessed LED:

1. Install 1/2” metal flex to fixture from adjacent 4” x 4” junction box with 90 degree C., #12 AWG wire plus green ground wire. Junction box shall be located within 48” of fixture. No more than 4 fixtures shall be connected to common junction box.

## 3.2 CONNECTIONS

A. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

## 3.3 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Advance Notice: Give dates and times for field tests.

C. Provide instruments to make and record test results.

D. Tests: As follows:

1. Verify normal operation of each fixture after installation.
2. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
3. Verify normal transfer to battery source and retransfer to normal.

E. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

F. Corrosive Fixtures: Replace during warranty period.

## 3.4 CLEANING AND ADJUSTING

A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

B. Adjust aimable fixtures to provide required light intensities.

END OF SECTION 26 51 00

# SECTION 28 31 11 - FIRE ALARM SYSTEMS

## PART 1 – GENERAL

### 1.1. SUMMARY

A. This Section covers fire alarm systems, including initiating devices, notification appliances, controls, and supervisory devices.

B. Work covered by this section includes the furnishing of labor, equipment, and materials for installation of the fire alarm system as indicated on the drawings and specifications.

C. The Fire Alarm System shall consist of all necessary hardware equipment and software programming to perform the following functions:

1. Fire alarm and detection operations
2. Control and monitoring of elevators, smoke control equipment, door hold-open devices, fire suppression systems, emergency power systems, and other equipment as indicated in the drawings and specifications.

### 1.2. RELATED DOCUMENTS

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

B. The work covered by this section is to be coordinated with related work as specified elsewhere in the specifications. Requirements of the following sections apply:

1. Division 26: "Basic Electrical Materials and Methods."
2. Division 26: "Wiring Methods."
3. Division 23: "HVAC Systems"

C. The system and all associated operations shall be in accordance with the following:

1. Guidelines of the following Building Code:
2. NFPA 72, National Fire Alarm Code
3. NFPA 70, National Electrical Code

### 1.3. SYSTEM DESCRIPTION

A. General: Provide initiating devices, notification appliances, and monitoring

and control devices as indicated on the drawings and as specified herein.

B. Software: The fire alarm system shall allow for loading and editing instructions and operating sequences as necessary. The system shall be capable of on-site programming to accommodate system expansion and facilitate changes in operation. All software operations shall be stored in a non-volatile programmable memory within the fire alarm control unit. Loss of primary and secondary power shall not erase the instructions stored in memory. System shall be capable of storing dual configuration programs with one active and one in reserve. Panel shall be capable of full system operation during a new configuration download.

C. History Logs: The system shall provide a means to recall alarms and trouble conditions in chronological order for the purpose of recreating an event history. A separate alarm and trouble log shall be provided.

D. Recording of Events: Record all alarm, supervisory, and trouble events by means of system printer. The printout shall include the type of signal (alarm, supervisory, or trouble) the device identification, date and time of the occurrence. The printout differentiates alarm signals from all other printed indications.

E. Wiring/Signal Transmission:

1. Transmission shall be addressable signal transmission, dedicated to fire alarm service only.
2. System connections for initiating, signaling line circuits and notification appliance circuits shall be Class B.
3. Circuit Supervision: Circuit faults shall be indicated by a trouble signal at the FACP. Provide a distinctive indicating audible tone and alphanumeric annunciation.

F. Required Functions: The following are required system functions and operating features:

1. Priority of Signals: Fire alarm events have highest priority. Subsequent alarm events are queued in the order received and do not affect existing alarm conditions. Priority Two, Supervisory and Trouble events have second-, third-, and fourth-level priority respectively. Signals of a higher-level priority take precedence over signals of lower priority even though the lower-priority condition occurred first. Annunciate all events regardless of priority or order received.
2. Noninterfering: An event on one zone does not prevent the receipt of signals from any other zone. All zones are manually resettable from the FACP after the initiating device or devices are restored to normal. The activation of an addressable device does not prevent the receipt of signals from subsequent addressable device activations.

3. Transmission to Remote Central Station: Automatically route alarm, supervisory, and trouble signals to a remote central station service transmitter provided under another contract.
4. Annunciation: Operation of alarm and supervisory initiating devices shall be annunciated at the FACP and the remote annunciator, indicating the location and type of device.
5. General Alarm: A system general alarm shall include:
    a) Indication of alarm condition at the FACP and the annunciator(s).
    b) Identification of the device /zone that is the source of the alarm at the FACP and the annunciator(s).
    c) Operation of audible and visible notification devices throughout the building until silenced at FACP.
    d) Closing doors normally held open by magnetic door holders.
    e) Unlocking designated doors.
    f) Shutting down supply and return fans serving zone where alarm is initiated.
    g) Closing smoke dampers on system serving zone where alarm is initiated.
    h) Initiation of smoke control sequence through the building temperature control system.
    i) Notifying the local fire department.
    j) Initiation of elevator recall in accordance with ASME/ANSI A17.1, when specified detectors or sensors are activated.
6. Supervisory Operations: Upon activation of a supervisory device such as fire pump power failure, low air pressure switch, and tamper switch, the system shall operate as follows:
    a) Activate the system supervisory service audible signal and illuminate the LED at the control unit and the remote annunciator.
    b) Pressing the Supervisory Acknowledge Key will silence the supervisory audible signal while maintaining the Supervisory LED "on" indicating off-normal condition.
    c) Record the event in the FACP historical log.
    d) Transmission of supervisory signal to remote central station.
    e) Restoring the condition shall cause the Supervisory LED to clear and restore the system to normal.
7. Alarm Silencing: If the "Alarm Silence" button is pressed, all audible and

visible alarm signals shall cease operation.

8. System Reset

   a) The "System Reset" button shall be used to return the system to its normal state. Display messages shall provide operator assurance of the sequential steps ("IN PROGRESS", "RESET COMPLETED") as they occur. The system shall verify all circuits or devices are restored prior to resetting the system to avoid the potential for re-alarming the system. The display message shall indicate "ALARM PRESENT, SYSTEM RESET ABORTED."

   b) Should an alarm condition continue, the system will remain in an alarmed state.

9. A manual evacuation (drill) switch shall be provided to operate the notification appliances without causing other control circuits to be activated.

10. WALKTEST: The system shall have the capacity of 8 programmable passcode protected one person testing groups, such that only a portion of the system need be disabled during testing. The actuation of the "enable one person test" program at the control unit shall activate the "One Person Testing" mode of the system as follows:

    a) The city circuit connection and any suppression release circuits shall be bypassed for the testing group.

    b) Control relay functions associated to one of the 8 testing groups shall be bypassed.

    c) The control unit shall indicate a trouble condition.

    d) The alarm activation of any initiation device in the testing group shall cause the audible notification appliances assigned only to that group to sound a code to identify the device or zone.

    e) The unit shall automatically reset itself after signaling is complete.

    f) Any opening of an initiating or notification appliance circuit wiring shall cause the audible signals to sound for 4 seconds indicating the trouble condition.

G. Analog Smoke Sensors:

1. Monitoring: FACP shall individually monitor sensors for calibration, sensitivity, and alarm condition, and shall individually adjust for sensitivity. The control unit shall determine the condition of each sensor by comparing the sensor value to the stored values.

2. Environmental Compensation: The FACP shall maintain a moving average of the sensor's smoke chamber value to automatically compensate for

dust, dirt, and other conditions that could affect detection operations.

3. Programmable Sensitivity: Photoelectric Smoke Sensors shall have 7 selectable sensitivity levels ranging from 0.2% to 3.7%, programmed and monitored from the FACP.
4. Sensitivity Testing Reports: The FACP shall provide sensor reports that meet NFPA 72 calibrated test method requirements. The reports shall be viewed on a CRT Display or printed for annual recording and logging of the calibration maintenance schedule.
5. The FACP shall automatically indicate when an individual sensor needs cleaning. The system shall provide a means to automatically indicate when a sensor requires cleaning. When a sensor's average value reaches a predetermined value, (3) progressive levels of reporting are provided. The first level shall indicate if a sensor is close to a trouble reporting condition and will be indicated on the FACP as "ALMOST DIRTY." This condition provides a means to alert maintenance staff of a sensor approaching dirty without creating a trouble in the system. If this indicator is ignored and the second level is reached, a "DIRTY SENSOR" condition shall be indicated at the FACP and subsequently a system trouble is reported to the Central Monitoring Station. The sensor base LED shall glow steady giving a visible indication at the sensor location. The "DIRTY SENSOR" condition shall not affect the sensitivity level required to alarm the sensor. If a "DIRTY SENSOR" is left unattended, and its average value increases to a third predetermined value, an "EXCESSIVELY DIRTY SENSOR" trouble condition shall be indicated at the control unit.
6. The FACP shall continuously perform an automatic self-test on each sensor which will check sensor electronics and ensure the accuracy of the values being transmitted. Any sensor that fails this test shall indicate a "SELF TEST ABNORMAL" trouble condition.]
7. Multi-Sensors shall combine photoelectric smoke sensing and heat sensing technologies. An alarm shall be determined by either smoke detection, with selectable sensitivity from 0.2 to 3.7 %/ft obscuration; or heat detection, selectable as fixed temperature or fixed with selectable rate-of-rise; or based on an analysis of the combination of smoke and heat activity.
8. Programmable bases. It shall be possible to program relay and sounder bases to operate independently of their associated sensor.
9. Magnet test activation of smoke sensors shall be distinguished by its label and history log entry as being activated by a magnet.

H. Smoke Detectors: A maintenance and testing service providing the following shall be included with the base bid:

1. Biannual sensitivity reading and logging for each smoke sensor.
2. Scheduled biannual threshold adjustments to maintain proper sensitivity

for each smoke sensor.

3. Threshold adjustment to any smoke sensor that has alarmed the system without the presence of particles of combustion.
4. Scheduled biannual cleaning or replacement of each smoke detector or sensor within the system.
5. Semi-annual functional testing of each smoke detector or sensor using the manufacturer's calibrated test tool.
6. Written documentation of all testing, cleaning, replacing, threshold adjustment, and sensitivity reading for each smoke detector or sensor device within the system.
7. The initial service included in the bid price shall provide the above listed procedures for a period of five years after owner acceptance of the system.

I. Audible Alarm Notification: By horns in areas as indicated on drawings.

J. Power Requirements

1. The control unit shall receive AC power via a dedicated fused disconnect circuit or circuit breaker.
2. The system shall be provided with sufficient battery capacity to operate the entire system upon loss of normal AC power in a normal supervisory mode for a period of 24 hours with 5 minutes of alarm operation at the end of this period. The system shall automatically transfer to battery standby upon power failure. All battery charging and recharging operations shall be automatic.
3. All circuits requiring system-operating power shall be 24 VDC and shall be individually fused at the control unit.
4. The incoming power to the system shall be supervised so that any power failure will be indicated at the control unit. A green "power on" LED shall be displayed continuously at the user interface while incoming power is present.
5. The system batteries shall be supervised so that a low battery or a depleted battery condition, or disconnection of the battery shall be indicated at the control unit and displayed for the specific fault type.
6. The system shall support NAC Lockout feature to prevent subsequent activation of Notification Appliance Circuits after a Depleted Battery condition occurs in order to make use of battery reserve for front panel annunciation and control.
7. The system shall support 100% of addressable devices in alarm or operated at the same time, under both primary (AC) and secondary (battery) power conditions.

8. Loss of primary power shall sound a trouble signal at the FACP. FACP shall indicate when the system is operating on an alternate power supply.

1.4. SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

1. Product data sheets for system components highlighted to indicate the specific products, features, or functions required to meet this specification. Alternate or as-equal products submitted under this contract must provide a detailed line-by-line comparison of how the submitted product meets, exceeds, or does not comply with this specification.
2. Wiring diagrams from manufacturer.
3. Shop drawings showing system details including location of FACP, all devices, and circuiting.
4. System Power and battery charts and voltage drop calculations to assure that the system will operate per the prescribed backup time periods and under all voltage conditions per UL and NFPA standards.

1.5. QUALITY ASSURANCE

A. Installer Qualifications: A factory authorized installer is to perform the work of this section.

B. Each and all items of the Fire Alarm System shall be listed as a product of a single fire alarm system manufacturer under the appropriate category by Underwriters Laboratories, Inc. (UL), and shall bear the "UL" label.

1.6. MAINTENANCE SERVICE

A. Maintenance Service Contract: Provide maintenance of fire alarm systems and equipment for a period of 12 months, using factory-authorized service representatives.

B. Basic Services: Systematic, routine maintenance visits on a quarterly basis at times scheduled with the Owner. In addition, respond to service calls within 24 hours of notification of system trouble. Adjust and replace defective parts and components with original manufacturer's replacement parts, components, and supplies.

C. Additional Services: Perform services within the above 12-month period not classified as routine maintenance or as warranty work when authorized in writing. Compensation for additional services must be agreed upon in writing prior to performing services.

D. Renewal of Maintenance Service Contract: No later than 60 days prior to

the expiration of the maintenance services contract, deliver to the Owner a proposal to provide contract maintenance and repair services for an additional one-year term. Owner will be under no obligation to accept maintenance service contract renewal proposal.

PART 2 – PRODUCTS

2.1 ADDRESSABLE MANUAL PULL STATIONS

A. Description: Addressable single- or double-action type, red LEXAN, with molded, raised-letter operating instructions of contrasting color. Station will mechanically latch upon operation and remain so until manually reset by opening with a key common with the control units.

B. Protective Shield: Where required provide a tamperproof, clear LEXAN shield and red frame that easily fits over manual pull stations. When shield is lifted to gain access to the station, a battery powered piercing warning horn shall be activated. The horn shall be silenced by lowering and realigning the shield. The horn shall provide 85dB at 10 feet and shall be powered by a 9 VDC battery.]

2.2. SMOKE SENSORS

A. General: Comply with UL 268, "Smoke Detectors for Fire Protective Signaling Systems." Include the following features:

1. Factory Nameplate: Serial number and type identification.
2. Operating Voltage: 24 VDC, nominal.
3. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore normal operation.
4. Plug-In Arrangement: Sensor and associated electronic components are mounted in a module that connects to a fixed base with a twist-locking plug connection. Base shall provide break-off plastic tab that can be removed to engage the head/base locking mechanism. No special tools shall be required to remove head once it has been locked. Removal of the detector head shall interrupt the supervisory circuit of the fire alarm detection loop and cause a trouble signal at the control unit.
5. Each sensor base shall contain an LED that will flash each time it is scanned by the Control Unit (once every 4 seconds). In alarm condition, the sensor base LED shall be on steady.
6. Each sensor base shall contain a magnetically actuated test switch to provide for easy alarm testing at the sensor location.
7. Each sensor shall be scanned by the Control Unit for its type identification to prevent inadvertent substitution of another sensor type. Upon detection of a "wrong device", the control unit shall operate with the installed device

at the default alarm settings for that sensor; 2.5% obscuration for photoelectric sensor, 135-deg F and 15-deg F rate-of-rise for the heat sensor, but shall indicate a "Wrong Device" trouble condition.

8. The sensor's electronics shall be immune from false alarms caused by EMI and RFI.
9. Sensors include a communication transmitter and receiver in the mounting base having a unique identification and capability for status reporting to the FACP. Sensor address shall be located in base to eliminate false addressing when replacing sensors.
10. Removal of the sensor head for cleaning shall not require the setting of addresses.

B. Type: Smoke sensors shall be of the photoelectric type.

C. Bases: Relay output, sounder and isolator bases shall be supported alternatives to the standard base.

D. Duct Smoke Sensor: Photoelectric type, with sampling tube of design and dimensions as recommended by the manufacturer for the specific duct size and installation conditions where applied. Sensor includes relay as required for fan shutdown.

1. Environmental compensation, programmable sensitivity settings, status testing, and monitoring of sensor dirt accumulation for the duct sensor shall be provided by the FACP.
2. The Duct Housing shall provide a supervised relay driver circuit for driving up to 15 relays with a single "Form C" contact rated at 7A@ 28VDC or 10A@ 120VAC. This auxiliary relay output shall be fully programmable. Relay shall be mounted within 3 feet of HVAC control circuit.
3. Duct Housing shall provide a relay control trouble indicator Yellow LED.
4. Compact Duct Housing shall have a transparent cover to monitor for the presence of smoke. Cover shall secure to housing by means of four (4) captive fastening screws.
5. Duct Housing shall provide two (2) Test Ports for measuring airflow and for testing. These ports will allow aerosol injection in order to test the activation of the duct smoke sensor.
6. Duct Housing shall provide a magnetic test area and Red sensor status LED.
7. For maintenance purposes, it shall be possible to clean the duct housing sampling tubes by accessing them through the duct housing front cover.
8. Each duct sensor shall have a Remote Test Station with an alarm LED and test switch.
9. Where indicated provide a NEMA 4X weatherproof duct housing enclosure

shall provide for the circulation of conditioned air around the internally mounted addressable duct sensor housing to maintain the sensor housing at its rated temperature range. The housing shall be UL Listed to Standard 268A.

2.3. HEAT SENSORS

A. Thermal Sensor: Combination fixed-temperature and rate-of-rise unit with plug-in base and alarm indication lamp; 135-deg F fixed-temperature setting except as indicated.

B. Thermal sensor shall be of the epoxy encapsulated electronic design. It shall be thermistor-based, rate-compensated, self-restoring and shall not be affected by thermal lag.

C. Sensor fixed temperature sensing shall be independent of rate-of-rise sensing and] programmable to operate at 135-deg F or 155-deg F. Sensor rate-of-rise temperature detection shall be selectable at the FACP for either 15-deg F or 20-deg F per minute.

D. Sensor shall have the capability to be programmed as a utility monitoring device to monitor for temperature extremes in the range from 32-deg F to 155-deg F.

2.4. ADDRESSABLE CIRCUIT INTERFACE MODULES

A. Addressable Circuit Interface Modules: Arrange to monitor one or more system components that are not otherwise equipped for addressable communication. Modules shall be used for monitoring of water flow, valve tamper, non-addressable devices, and for control of evacuation indicating appliances and AHU systems.

B. Addressable Circuit Interface Modules will be capable of mounting in a standard electric outlet box. Modules will include cover plates to allow surface or flush mounting. Modules will receive their operating power from the signaling line or a separate two wire pair running from an appropriate power supply as required.

C. There shall be the following types of modules:

1. Type 1: Monitor Circuit Interface Module:

a) For conventional 2-wire smoke detector and/or contact device monitoring with Class B or Class A wiring supervision. The supervision of the zone wiring will be Class B. This module will communicate status (normal, alarm, trouble) to the FACP.

b) For conventional 4-wire smoke detector with Class B wiring

supervision. The module will provide detector reset capability and over-current power protection for the 4-wire detector. This module will communicate status (normal, alarm, trouble) to the FACP.

2. Type 2: Line Powered Monitor Circuit Interface Module

   a) This type of module is an individually addressable module that has both its power and its communications supplied by the two wire multiplexing signaling line circuit. It provides location specific addressability to an initiating device by monitoring normally open dry contacts. This module shall have the capability of communicating four zone status conditions (normal, alarm, current limited, trouble) to the FACP.

   b) This module shall provide location specific addressability for up to five initiating devices by monitoring normally closed or normally open dry contact security devices. The module shall communicate four zone status conditions (open, normal, abnormal, and short). The two-wire signaling line circuit shall supply power and communications to the module.

3. Type 4: Line Powered Control Circuit Interface Module –

   a) This module shall provide control and status tracking of a Form "C" contact. The two-wire signaling line circuit shall supply power and communications to the module.

D. All Circuit Interface Modules shall be supervised and uniquely identified by the control unit. Module identification shall be transmitted to the control unit for processing according to the program instructions. Modules shall have an on-board LED to provide an indication that the module is powered and communicating with the FACP. The LEDs shall provide a troubleshooting aid since the LED blinks on poll whenever the peripheral is powered and communicating.

## 2.5. STANDARD ALARM NOTIFICATION APPLIANCES

A. Visible/Only

Strobe shall be listed to UL 1971. The V/O shall consist of a xenon flash tube and associated lens/reflector system. The V/O enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings. V/O appliances shall be provided with different minimum flash intensities of 15cd, 30cd, 75cd and 110cd. Provide a label inside the strobe lens to indicate the listed candela rating of the specific Visible/Only appliance.

B. Audible/Visible

Combination Audible/Visible (A/V) Notification Appliances shall be listed to UL 1971 and UL 464. The strobe light shall consist of a xenon flash tube and associated lens/reflector system. Provide a label inside the strobe lens to indicate the listed candela rating of the specific strobe. The horn shall have a minimum sound pressure level of 85 dBA @ 24VDC. The audible/visible enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings.

C. Notification Appliance Circuit provides synchronization of strobes at a rate of 1Hz and operates horns with a Temporal Code Pattern operation. The circuit shall provide the capability to silence the audible signals, while the strobes continue to flash, over a single pair of wires. The capability to synchronize multiple notification appliance circuits shall be provided.

## PART 3 – EXECUTION

### 3.1. INSTALLATION, GENERAL

A. Install system components and all associated devices in accordance with applicable NFPA Standards and manufacturer's recommendations.

B. Installation personnel shall be supervised by persons who are qualified and experienced in the installation, inspection, and testing of fire alarm systems. Examples of qualified personnel shall include, but not be limited to, the following:

1. Factory trained and certified personnel.
2. National Institute of Certification in Engineering Technologies (NICET) fire alarm level II certified personnel.
3. Personnel licensed or certified by state or local authority.

### 3.2. EQUIPMENT INSTALLATION

A. Furnish and install a complete Fire Alarm System as described herein and as shown on the plans. Include sufficient control unit(s), annunciator(s), manual stations, automatic fire detectors, smoke detectors, audible and visible notification appliances, wiring, terminations, electrical boxes, and all other necessary material for a complete operating system.

B. Device Location-Indicating Lights: Locate in the public space immediately adjacent to the device they monitor.

## 3.3. WIRING INSTALLATION

A. System Wiring: Wire and cable shall be a type listed for its intended use by an approval agency acceptable to the Authority Having Jurisdiction (AH and shall be installed in accordance with the appropriate articles from the current approved edition of NFPA 70: National Electric Code (NEC).

B. Contractor shall obtain from the Fire Alarm System Manufacturer written instruction regarding the appropriate wire/cable to be used for this installation. No deviation from the written instruction shall be made by the Contractor without the prior written approval of the Fire Alarm System Manufacturer.

C. Color Coding: Color-code fire alarm conductors differently from the normal building power wiring. Use one color code for alarm initiating device circuits wiring and a different color code for supervisory circuits. Color-code notification appliance circuits differently from alarm-initiating circuits. Paint fire alarm system junction boxes and covers red.

## 3.4. FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Provide services of a factory-authorized service representative to supervise the field assembly and connection of components and the pretesting, testing, and adjustment of the system.

B. Service personnel shall be qualified and experienced in the inspection, testing, and maintenance of fire alarm systems. Examples of qualified personnel shall be permitted to include, but shall not be limited to, individuals with the following qualifications:

1. Factory trained and certified.
2. National Institute for Certification in Engineering Technologies (NICET) fire alarm certified.
3. International Municipal Signal Association (IMSA) fire alarm certified.
4. Certified by a state or local authority.
5. Trained and qualified personnel employed by an organization listed by a national testing laboratory for the servicing of fire alarm systems.

C. Pretesting: Determine, through pretesting, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new and retest until satisfactory performance and conditions are achieved.

D. Final Test Notice: Provide a 10-day minimum notice in writing when the system is ready for final acceptance testing.

E. Minimum System Tests: Test the system according to the procedures outlined in NFPA 72.

F. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets the Specifications and complies with applicable standards.

G. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log.

H. Final Test, Certificate of Completion, and Certificate of Occupancy:

1. Test the system as required by the Authority Having Jurisdiction in order to obtain a certificate of occupancy.

## 3.5. TRAINING

A. Provide the services of a factory-authorized service representative to demonstrate the system and train Owner's maintenance personnel as specified below.

1. Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventive maintaining of the system. Provide a minimum of 8 hours' training.
2. Schedule training with the Owner at least seven days in advance.

END OF SECTION 28 31 11

# SECTION 31 31 16 - TERMITE CONTROL

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

### 1.2 SECTION INCLUDES

A. Provide soil treatment for termite control below grade as specified.

### 1.3 REFERENCE STANDARDS

A. Environmental Protection Agency.

B. Florida Department of Agriculture & Consumer Services.

C. Florida Statute Chapter 482; latest version.

### 1.4 REFERENCES

A. Refer to specification Section 01 41 00 - Regulatory Requirements for code requirements and code standards applicable to all materials and work necessary to complete the scope of work.

### 1.5 ACTION SUBMITTALS

A. Submit four copies of manufacturer's technical data and application instructions.

B. Include toxicants, composition by percentage, dilution schedule, and intended application rate.

C. Submit copy of Safety Data Sheet.

D. Provide additional submittal requirements as requested to support the projects compliance with Green Globe's Building Initiative. Refer to Section 01 81 13 - Green Building Initiative Requirements for additional information.

### 1.6 QUALITY ASSURANCE

A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for the work, including preparation of substrate and application.

B. Engage a professional pest control operator, licensed by the State of Florida for application of soil treatment solution.

C. Installation must comply with the latest version of Chapter 482 Fl Statute.

### 1.7 JOB CONDITIONS

A. Do not apply soil treatment solution until excavating, filling and grading operations are completed except as otherwise required in construction operations.

B. Ensure penetration; do not apply soil treatment during inclement weather.

C. Comply with other handling and application instructions of the soil toxicant manufacturer.

### 1.8 GUARANTEE

A. Furnish four-copies of written guarantee certifying that the applied soil poisoning treatment will prevent the infestation of subterranean termites for warranty period.
   1. If subterranean termite activity is discovered during the guarantee period, the Contractor is responsible for re-treat of the soil and repair or replace of damage to the building and its contents caused by termite infestation.

B. Provide guarantee for a period of 5 years.

C. The Owner reserves the right to renew warranty for an additional 5-year at an additional cost.

### 1.9 PROJECT CLOSEOUT

A. Record the moisture content of soil before application, date, and rate of application, areas of application, diary of toxicity meter readings and corresponding soil coverage.

## PART 2 PRODUCTS

### 2.1 SOIL TREATMENT SOLUTION

A. Conform to applicable code for requirements and for application in accordance with EPA and Florida Department of Agriculture & Consumer Services approved emulsifiable concentrate insecticide for dilution with water, specially formulated to prevent infestation by termites.

B. Fuel oil is not permitted as a diluent.

C. Other solutions acceptable to local governing authorities and the EPA may be used.
   1. Use only soil treatment solutions, which are not injurious to planting.

## PART 3 EXECUTION

### 3.1 INSPECTION

A. Before applying soil treatment for termites, examine areas and conditions; notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
   1. Do not proceed with the work until conditions are satisfactory.

B. Verify that final grading is complete.

### 3.2 APPLICATION

A. Surface Preparation:
   1. Remove foreign matter that could decrease effectiveness of treatment on areas to be treated.
   2. Loosen, rake and level soil-requiring treatment, except previously compacted areas under slabs and foundations.

B. Application Rates: Apply soil treatment solution as specified and in strict accordance with Manufacturer's recommendation for mixing and application.
   1. Allow not less than 12 hours for drying after application, before beginning concrete placement or other construction activities.
   2. Termite spray shall extend 2-foot minimum from exterior facade of building(s) and 1-foot high vertically from the ground.
   3. Post signs in the areas of application warning workers of soil poisoning.
      a. Remove signs before other construction covers the treated area.
   4. Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following initial application.

**END OF SECTION**