# TERHUNE GROUND FLOOR AND FIRST FLOOR BOOKSTORE RENOVATIONS

SPARTANBURG COMMUNITY COLLEGE (GILES CAMPUS)
107 Community College Drive
Spartanburg, SC 29303

**State Project No. H59-6288-JM**

# PROJECT MANUAL

ISSUED FOR CONSTRUCTION

**PREPARED BY:**

**LS3P ASSOCIATES LTD.**

2 West Washington Street, Suite. 600
Greenville, SC 29601

**REVISED JUNE 6, 2025**

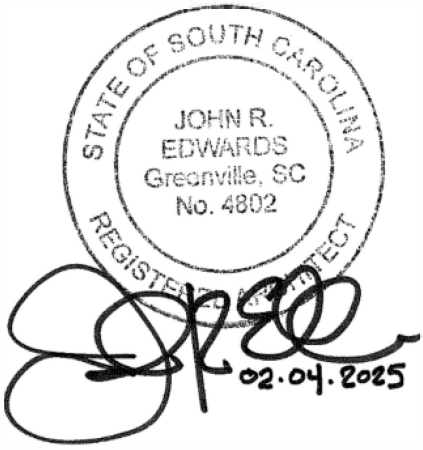
LS3P PROJECT NO.: 3202-240135

# Spartanburg Community College (Giles Campus)

# Terhune Ground Floor and First Floor Bookstore Renovations

Spartanburg, South Carolina




**Architect**

LS3P Associates, LTD

2 West Washington Street, Suite 600

Greenville, South Carolina 29601

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Principal in Charge: John Edwards, AIA, NCARB

Senior Project Manager: Douglas K Rackley, AIA, LEED AP, WELL AP, GGP

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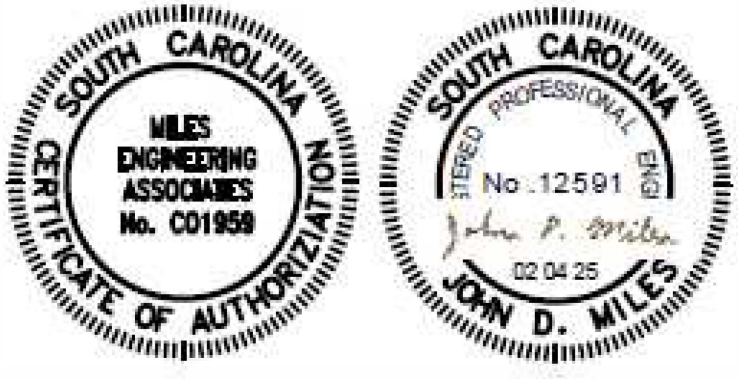
864.235.6197 (d)

## CONSULTING ENGINEERS

### FIRE PROTECTION ENGINEERING

**MILES ENGINEERING ASSOCIATES, LLC**

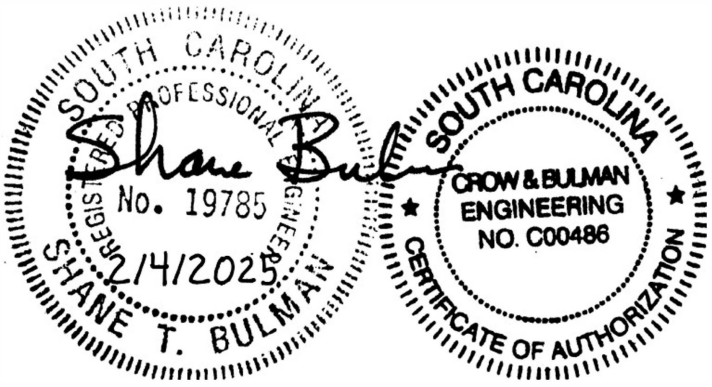
200 Oakhurst Rd
Blythewood, South Carolina 29016
Office 803.391.2607
John Miles, PE
jmiles@milesengr.com




### PLUMBING ENGINEERING

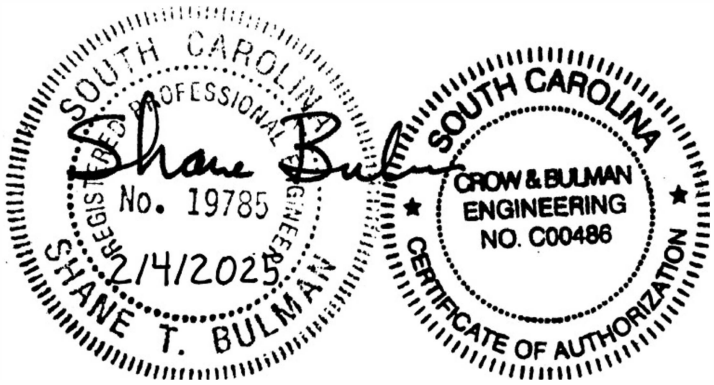
**CROW & BULMAN ENGINEERING, INC**

800 East Main Street
Spartanburg, South Carolina 29302
Office 864.585.9903
Shane Bulman, PE
sbulman@cbengr.com



**CROW & BULMAN ENGINEERING, INC**

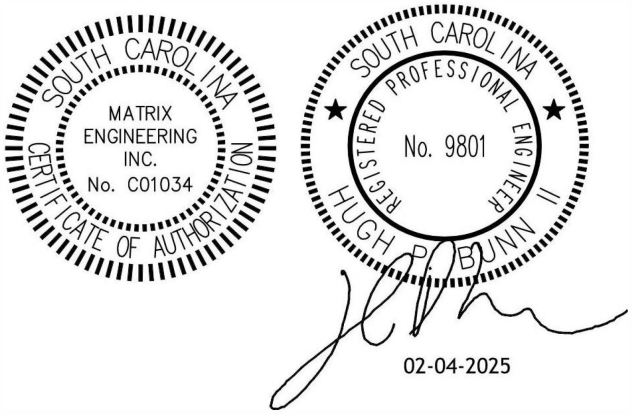
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**ELECTRICAL ENGINEERING**

**MATRIX ENGINEERING, INC.**

912 South Pine Street
Spartanburg, South Carolina 29302
Office 864-583-6274
Hugh P. Bunn, PE
pbunn@matrixei.com




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**PROJECT NUMBER:** H50-6288-JM


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

**AGENCY:** SCC - Spartanburg Community College

**PROJECT NAME:** Terhune Ground Floor and First Floor Bookstore Renovation

**PROJECT NUMBER:** H59-6288-JM **CONSTRUCTION COST RANGE:** $3,000,000 **to** $3,500,000

**PROJECT LOCATION:** Terhune Building

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

Selected building renovations, demolition, plumb, fire protection mech, electrical

**BID/SUBMITTAL DUE DATE:** 08/05/2025 **TIME:** 02:00 PM **NUMBER OF COPIES:** 1

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

**AGENCY PROJECT COORDINATOR:** Michael Clardy

**EMAIL:** clardym@sccsc.edu **TELEPHONE:** (864) 592-4188

**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:** LS3P Associates, Ltd. - Greenville **A/E CONTACT:** Douglas Rackley,AIA

**EMAIL:** douglasrackley@ls3p.com **TELEPHONE:** (864) 235-6197

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

**PRE-BID DATE:** 07/09/2025 **TIME:** 10:00 AM

**PRE-BID PLACE:** Giles Campus, Dan L. Terhune Building, 107 Community College Drive, Spartanburg SC 29303

**BID OPENING PLACE:** Giles Campus, Ledbetter Building Room 137, 103 Community College Dr. Spartanburg, SC 29303

**BID DELIVERY ADDRESSES:**

**HAND-DELIVERY:**

**Attn:** Sheri Johnson- BID ENCLOSED

Room 140, James P. Ledbetter Building, 103 Community College Drive, Spartanburg,SC 29303

**MAIL SERVICE:**

**Attn:** Sheri Johnson - BID ENCLOSED

Spartanburg Community College, 131 Community College Drive,Spartanburg, SC 29303

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

**APPROVED BY:** James R. McVay Jr. **DATE:** 06/24/2025

(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)*
Terhune Ground Floor and First Floor Bookstore Renovations
H59-6288-JM
107 Community College Drive, Spartanburg, SC 29303

**THE OWNER:**
*(Name, legal status, address, and other information)*
Spartanburg Community College
107 Community College Drive
Spartanburg, SC 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)*
LS3P ASSOCIATES LTD.
2 West Washington Street, Suite 600
Greenville, SC 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** All requested Alternates shall be bid. The failure of the Bidder to indicate a price for an Alternate shall 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 Bid an Alternate, except as expressly allowed by law;
- **.6** Failure to list qualified subcontractors as required by law;
- **.7** Showing any material modification(s) or exception(s) qualifying the Bid;
- **.8** Faxing a Bid directly to the Owner or Owner's representative; or
- **.9** 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 - SCC Giles Campus
**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 |
|---|---|---|
| Refer to BID DRAWINGS INDEX | | |

**.5** Specifications

| Section | Title | Date | Pages |
|---|---|---|---|
| Refer to BID SPEC TOC | | | |



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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 Tax Credit For Subcontracting With Minority Firms

**§ 9.5.1** Pursuant to S.C. Code Ann. §12-6-3350, taxpayers, who utilize certified minority subcontractors, may take a tax credit equal to 4% of the payments they make to said subcontractors. The payments claimed must be based on work performed directly for a South Carolina state contract. The credit is limited to a maximum of fifty thousand dollars annually. The taxpayer is eligible to claim the credit for 10 consecutive taxable years beginning with the taxable year in which the first payment is made to the subcontractor that qualifies for the credit. After the above ten consecutive taxable years, the taxpayer is no longer eligible for the credit. The credit may be claimed on Form TC-2, "Minority Business Credit." A copy of the subcontractor's certificate from the Governor's Office of Small and Minority Business (OSMBA) is to be attached to the contractor's income tax return.


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**§ 9.5.2** Taxpayers must maintain evidence of work performed for a State contract by the minority subcontractor. Questions regarding the tax credit and how to file are to be referred to: SC Department of Revenue, Research and Review, Phone: (803) 898-5786, Fax: (803) 898-5888.

**§ 9.5.3** The subcontractor must be certified as to the criteria of a "Minority Firm" by the Governor's Office of Small and Minority Business Assistance (OSMBA). Certificates are issued to subcontractors upon successful completion of the certification process. Questions regarding subcontractor certification are to be referred to: Governor's Office of Small and Minority Business Assistance, Phone: (803) 734-0657, Fax: (803) 734-2498. Reference: S.C. Code Ann. §11-35-5010 – Definition for Minority Subcontractor & S.C. Code Ann. §11-35-5230 (B) – Regulations for Negotiating with State Minority Firms.

### § 9.6 Other Special Conditions Of The Work



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DRAFT **AIA® Document A310™ – 2010**

## *Bid Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

« »« »
« »

**SURETY:**
*(Name, legal status and principal place of business)*

« »« »
« »

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

« »« »
« »

**BOND AMOUNT:** $ « »

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

« »
« »
« »

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

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

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

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

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

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

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**User Notes:** (1735354994)

Signed and sealed this « » day of « » , « »

| | |
|---|---|
| | « » |
| | *(Contractor as Principal)* *(Seal)* |
| | « » |
| *(Witness)* | *(Title)* |
| | « » |
| | *(Surety)* *(Seal)* |
| | « » |
| *(Witness)* | *(Title)* |

DRAFT

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**User Notes**: (1735354994)

# 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:** Terhune Ground Floor and First Floor Bookstore Renovations

**PROJECT NUMBER:** H59-6288-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)*****:** The project consists of area renovations to the Ground Floor lobby and office conversions and the First Floor lobby and book store.

**$** _____, 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 the following page BF-2A)***

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

| (A) SUBCONTRACTOR LICENSE CLASSIFICATION or SUBCLASSIFICATION NAME *(Completed by Agency)* | (B) LICENSE CLASSIFICATION or SUBCLASSIFICATION ABBREVIATION *(Completed by Agency)* | (C) SUBCONTRACTOR and/or PRIME CONTRACTOR *(Required - must be completed by Bidder)* | (D) SUBCONTRACTOR'S and/or PRIME CONTRACTOR'S SC LICENSE NUMBER *(Requested, but not Required)* |
|---|---|---|---|
| **BASE BID** | | | |
| Plumbing | PB | | |
| Air Conditioning | AC | | |
| Electrical | EL | | |
| | | | |
| **ALTERNATE #1** | | | |
| N/A | | | |
| N/A | | | |
| N/A | | | |
| N/A | | | |
| **ALTERNATE #2** | | | |
| N/A | | | |
| N/A | | | |
| N/A | | | |
| N/A | | | |
| **ALTERNATE #3** | | | |
| N/A | | | |
| N/A | | | |
| N/A | | | |
| N/A | | | |

If a Bid Alternate is accepted, Subcontractors listed for the Bid Alternate shall be used for the work of both the Alternate and the Base Bid work.

# 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 himself) Bidder will use to perform this work.
   a. **Columns A & B**: The Agency fills out these columns to identify the subcontractor license classification / subclassification and related license abbreviation for which the Bidder must list either a subcontractor or himself as the entity that will perform this work. In Column A, the subcontractor license classification/subclassification is identified by name and in Column B, the related contractor license abbreviation (per Title 40 of the SC Code of Laws) is listed. 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 C and D:** In these columns, the Bidder identifies the subcontractors it will use for the work of each license listed by the Agency in Columns A & B. 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. Likewise, 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 Columns A & B. The subcontractor license must also be within the appropriate license group for the work. 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 must, except with the approval of the Agency for good cause shown, use the listed entities to perform the work for which they are listed.
7. 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.
8. Bidder's failure to identify an entity (subcontractor or himself) to perform the work of a subcontractor listed in Columns A & B 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 **334** 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 $**500.00** 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
107 Community College Drive
Spartanburg, SC 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)*

Terhune Ground Floor and First Floor Bookstore Renovations
H59-6288-JM
107 Community College Drive, Spartanburg, SC 29303

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

LS3P ASSOCIATES LTD.
2 West Washington Street, Suite 600
Greenville, SC 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.

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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:** CHRISTOPHER BOTELHO
**Title:** DIRECTOR OF CAMPUS OPERATIONS
**Address:** 107 COMMUNITY COLLEGE DR SPARTANBURG, SC 29303
**Telephone:** 864.592.4157
**Email:** botelhoc@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:** MICHAEL CLARDY, CPSM
**Title:** PROJECT MANAGER SPARTANBURG COMMUNITY COLLEGE
**Address:** 107 COMMUNITY COLLEGE DR SPARTANBURG, SC 29303
**Telephone:** 864.592.4188
**Email:** clardym@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:** DOUGLAS RACKLEY, AIA
**Title:** SENIOR PROJECT ARCHITECT - LS3P ASSOCIATES, LTD
**Address:** 2 W WASHINGTON ST SUITE 600 GREENVILLE SC 29601
**Telephone:** 864.235.6197
**Email:** douglasrackley@ls3p.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)*

☑ 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 |
|---|---|---|
| Refer to BID DRAWING SET INDEX - SHEET G-001 | | |

.6 Specifications

| Section | Title | Date | Pages |
|---|---|---|---|
| Refer to BID SET PROJECT MANUAL TABLE OF CONTENTS | | | |

.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 A101® – 2017 Exhibit A

## *Insurance and Bonds*

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the day of in the year
*(In words, indicate day, month and year.)*

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

Terhune Ground Floor and First Floor Bookstore Renovations
H59-6288-JM
107 Community College Drive, Spartanburg, SC 29303

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

Spartanburg Community College
107 Community College Drive
Spartanburg, SC 29303

The Owner is a Governmental Body of the State of South Carolina as defined by Title 11, Chapter 35 of the South Carolina Code of Laws, as amended.

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

This version of AIA Document A101–2017 Exhibit A is modified by the South Carolina Division of Procurement, Office of State Engineer. Publication of this version of AIA Document A101 Exhibit A does not imply the American Institute of Architects' endorsement of any modification by the South Carolina Division of Procurement, Office of State Engineer.

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

**TABLE OF ARTICLES**


**A.1 GENERAL**

**A.2 OWNER'S INSURANCE**

**A.3 CONTRACTOR'S INSURANCE AND BONDS**

**A.4 SPECIAL TERMS AND CONDITIONS**


### ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201®–2017, General Conditions of the Contract for Construction, SCOSE Version.

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## ARTICLE A.2 OWNER'S INSURANCE

### § A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

### § A.2.2 Liability Insurance

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

### § A.2.3 Reserved

### § A.2.3.1 Reserved

### § A.2.3.1.1 Reserved

### § A.2.3.1.2 Reserved

### § A.2.3.1.3 Reserved

### § A.2.3.1.4 Reserved

### § A.2.3.2 Reserved

### § A.2.3.3 Reserved

### § A.2.4 Optional Insurance.

The Owner shall purchase and maintain any insurance selected below.

☐ **§ A.2.4.1 Other Insurance**

*(List below any other insurance coverage to be provided by the Owner and any applicable limits.)*

| Coverage | Limits |
|---|---|

## ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

### § A.3.1 General

**§ A.3.1.1 Certificates of Insurance.** The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

**§ A.3.1.2 Deductibles and Self-Insured Retentions.** The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

**§ A.3.1.3 Additional Insured Obligations.** To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the


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Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

**§ A.3.1.4** A failure by the Owner to either (i) demand a certificate of insurance or written endorsement required by Section A.3, or (ii) reject a certificate or endorsement on the grounds that it fails to comply with Section A.3, shall not be considered a waiver of Contractor's obligations to obtain the required insurance.

**§ A.3.2 Contractor's Required Insurance Coverage**

**§ A.3.2.1** The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, for such other period for maintenance of completed operations coverage as specified in the Contract Documents, or unless a different duration is stated below:
*(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)*

**§ A.3.2.2 Commercial General Liability**

**§ A.3.2.2.1** Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than $1,000,000 each occurrence, $1,000,000 general aggregate, $1,000,000 aggregate for products-completed operations hazard, $1,000,000 personal and advertising injury, $50,000 fire damage (any one fire), and $5,000 medical expense (any one person) providing coverage for claims including

- **.1** damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- **.2** personal injury and advertising injury;
- **.3** damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
- **.4** bodily injury or property damage arising out of completed operations; and
- **.5** the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

**§ A.3.2.2.2** The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- **.1** Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- **.2** Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- **.3** Claims for bodily injury other than to employees of the insured.
- **.4** Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- **.5** Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- **.6** Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- **.7** Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- **.8** Claims related to roofing, if the Work involves roofing.
- **.9** Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- **.10** Claims related to earth subsidence or movement, where the Work involves such hazards.
- **.11** Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.


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**§ A.3.2.3** Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than $1,000,000 per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

**§ A.3.2.4** The Contractor may achieve the required limits and coverage for Commercial General Liability, Employers Liability, and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers. The umbrella policy limits shall not be less than $3,000,000.

**§ A.3.2.5** Workers' Compensation at statutory limits.

**§ A.3.2.6** Employers' Liability with policy limits not less than $100,000 each accident, $100,000 each employee, and $500,000 policy limit for claims, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed.

**§ A.3.2.7** Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks.

**§ A.3.2.8** Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate.

**§ A.3.2.9** Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate.

**§ A.3.3 Required Property Insurance**

**§ A.3.3.1** The Contractor shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Contractor's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.3.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds.

**§ A.3.3.1.1 Causes of Loss.** The insurance required by this Section A.3.3.1 shall provide coverage for direct physical loss or damage and shall include the risks of fire (with extended coverage), explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, workmanship, or materials.
*(Indicate below the cause of loss and any applicable sub-limit.)*

| Causes of Loss | Sub-Limit |
|---|---|

**§ A.3.3.1.2 Specific Required Coverages.** The insurance required by this Section A.3.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. (Indicate below the cause of loss and any applicable sub-limit.)


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| Causes of Loss | Sub-Limit |
|---|---|

**§ A.3.3.1.3** Unless the parties agree otherwise, upon Substantial Completion, the Owner shall replace the insurance policy required under Section A.3.3.1 with property insurance written for the total value of the Project.

**§ A.3.3.1.4 Deductibles and Self-Insured Retentions.** If the insurance required by this Section A.3.3 is subject to deductibles or self-insured retentions, the Contractor shall be responsible for all loss not covered because of such deductibles or retentions.

**§ A.3.3.2 Occupancy or Use Prior to Substantial Completion.** The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.3.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

**§ A.3.3.3** If the Owner requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Contractor shall, if possible, include such insurance, and the cost thereof shall be charged to the Owner by appropriate Change Order.

**§ A.3.3.4** Before an exposure to loss may occur, the Contractor shall file with the Owner a copy of each policy that includes insurance coverages required by this Section A.3.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project.

**§ A.3.4 Contractor's Other Insurance Coverage**

**§ A.3.4.1** Insurance selected and described in this Section A.3.4 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
*(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)*

**§ A.3.4.2** The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.4.1.
*(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)*

☐ **§ A.3.4.2.1 Reserved**

☐ **§ A.3.4.2.2** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

☐ **§ A.3.4.2.3** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

☐ **§ A.3.4.2.4 Boiler and Machinery Insurance**
The Contractor shall purchase and maintain boiler and machinery insurance as required, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this


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insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

**§ A.3.5 Performance Bond and Payment Bond**

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
*(Specify type and penal sum of bonds.)*

| Type | Penal Sum ($0.00) |
|---|---|
| Payment Bond | |
| Performance Bond | |

**§ A.3.5.1** Before commencing any services hereunder, the Contractor shall provide the Owner with Performance and Payment Bonds, each in an amount not less than the Contract Price set forth in Article 4 of the Agreement. The Surety shall have, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty". In addition, the Surety shall have a minimum "Best Financial Strength Category" of "Class V", and in no case less than five (5) times the contract amount. The Performance Bond shall be written on Form SE-355, "Performance Bond" and the Payment Bond shall be written on Form SE-357, "Labor and Material Payment Bond", and both shall be made payable to the Owner.

**§ A.3.5.2** The Performance and Labor and Material Payment Bonds shall:

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

**.2** be accompanied by a current power of attorney and certified by the attorney-in-fact who executes the bond on the behalf of the surety company; and

**.3** remain in effect for a period not less than one (1) year following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer.

**§ A.3.5.3** Any bonds required by this Contract shall meet the requirements of the South Carolina Code of Laws and Regulations, as amended.

**ARTICLE A.4 SPECIAL TERMS AND CONDITIONS**

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:


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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)*

Terhune Ground Floor and First Floor Bookstore Renovations
H59-6288-JM
107 Community College Drive, Spartanburg, SC 29303

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

Spartanburg Community College
107 Community College Drive
Spartanburg, SC 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)*

LS3P ASSOCIATES LTD.
2 West Washington Street, Suite 600
Greenville, SC 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 prior to submitting them for review and approval.

.2 The fire sprinkler shop drawings shall be reviewed and approved by the Architect's engineer of record (EOR) prior to submittal to the Office of State Fire Marshal (OSFM).

.3 The EOR shall submit to OSFM in accordance with the OSFM process.

.4 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 Minority Business Enterprises**

Contractor shall notify Owner of each Minority Business Enterprise (MBE) providing labor, materials, equipment, or supplies to the Project under a contract with the Contractor. Contractor's notification shall be via the first monthly status report submitted to the Owner after execution of the contract with the MBE. For each such MBE, the Contractor shall provide the MBE's name, address, and telephone number, the nature of the work to be performed or materials or equipment to be supplied by the MBE, whether the MBE is certified by the South Carolina Office of Small and Minority Business Assistance, and the value of the contract.

**§ 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: _____

Address: _____

_____

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: Terhune Ground Floor and First Floor Bookstore Renvoations

State Project Number: H59-6288-JM

Brief Description of Awarded Work: Project is a partial building renovation which includes new office spaces and lobby spaces, upgrades to electrical systems, plumbing systems and mechanical systems. The renovation of the First Floor Book store is also included

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

Name: LS3P Associates, LTD

Address: 2 W Washington Street, Suite 600

Greenville, SC 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: _____

Address: _____

_____

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: Terhune Ground Floor and First Floor Bookstore Renvoations

State Project Number: H59-6288-JM

Brief Description of Awarded Work: Project is a partial building renovation which includes new office spaces and lobby spaces, upgrades to electrical systems, plumbing systems and mechanical systems. The renovation of the First Floor Book store is also included

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

Name: LS3P Associates, LTD

Address: 2 W Washington Street, Suite 600

Greenville, SC 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_____** **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-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:** Terhune Ground Floor and First Floor Bookstore Renovations

**PROJECT NUMBER:** H59-6288-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.

# SECTION 01 10 00 - SUMMARY

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Project information.

1. Work covered by Contract Documents.
2. Phased construction.
3. Work by Owner.
4. Future work.
5. Purchase contracts.
6. Owner-furnished products.
7. Contractor-furnished, Owner-installed products.
8. Access to site.
9. Work restrictions.
10. Specification and drawing conventions.
11. Miscellaneous provisions.

### 1.3 PROJECT INFORMATION

Project Identification: H59-6288-JM Terhune Ground Floor and First Floor Bookstore Renovations

Project Location: 107 Community College Drive, Spartanburg, SC 29303

Owner: Spartanburg Community College

Owner's Representative: Michael Clardy, CPSM 864.592.4188 clardym@scc.edu

Architect: LS3P Associates, LTD, 2 W Washington Street, Suite 600, Greenville SC 29601
Douglas Rackley, AIA douglasrackley@ls3p.com 864.2356197

A. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:
   1. Refer to Drawing Cover Sheet for a list of consultants.

## 1.4 WORK COVERED BY CONTRACT DOCUMENTS

The Work of Project is defined by the Contract Documents and consists of the following:

The project consists of renovating sections of two floors of a single building – The Dan L. Terhune Building. The construction documents presented in this submittal are for renovations to sections of the Ground Floor and sections of the First Floor. The Ground Floor renovations include – departmental offices, police department and lobby. The renovations to the First Floor include the campus bookstore with offices and lobby. The building shall remain open during construction and access/egress shall be maintained at all times with barricades or other means to keep the general public out of the construction zone and safe from construction activities. The elevator shall remain operational and accessible during construction. Refer to the drawings for the scope of exterior and interior architectural renovations. The scope also includes selected areas for HVAC system modifications, new LED lighting, sprinkler system modifications, upgraded fire alarm system. Type of Contract: (refer to Project Manual)

Project will be constructed under a single prime contract.

## 1.5 WORK BY OWNER

General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

A. Subsequent Work: Owner will perform the following additional work at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory work under this Contract. The Contractor shall coordinate with the work preformed by the Owner.

Work performed by Owner or it's agents: Network Cabling, IT/ AV equipment installation, Furniture and Equipment installation.

## 1.6 CONTRACTOR-FURNISHED, OWNER-INSTALLED PRODUCTS

Contractor shall furnish products indicated. The Work includes unloading, handling, storing, and protecting Contractor-furnished products as directed and turning them over to Owner at Project closeout.

A. Contractor-Furnished, Owner-Installed Products:

None identified to date.

## 1.7 ACCESS TO SITE

Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

Limits: Confine construction operations to fenced in construction site bounded by the immediate perimeter of the existing building.

1. Limits: Limit site disturbance, including earthwork and clearing of vegetation.
2. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

   Schedule deliveries to minimize use of driveways and entrances by construction operations.

   a. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

## 1.8 COORDINATION WITH OCCUPANTS

Partial Owner Occupancy: Owner will occupy the surrounding campus during entire construction period, with the exception of areas under construction and bound by contractor fencing. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage of parking, pedestrian pathways and roadways. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.

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 authorities having jurisdiction.

1. Provide not less than 72 Insert number hours' notice to Owner of activities that will affect Owner's operations.
2. Maintain fire lane access through construction site for fire department access to existing hydrants and adjacent campus buildings.

## 1.9 WORK RESTRICTIONS

Work Restrictions, General: Comply with restrictions on construction operations.

Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

On-Site Work Hours: Limit work in the existing building to normal business working hours of 6:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise indicated.

Hours for Utility Shutdowns: Coordinate with the Owner.

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

Notify Architect and Owner not less than two days in advance of proposed utility interruptions.

1. Obtain Construction Manager's and Owner's written permission before proceeding with utility interruptions.

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

Notify Construction Manager and Owner not less than two <Insert number> days in advance of proposed disruptive operations.

2. Obtain Construction Manager's and written permission before proceeding with disruptive operations.

Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.

B. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

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

D. Employee Screening: Comply with Owner's requirements for [drug] [and] [background] screening of Contractor personnel working on Project site.

Maintain list of approved screened personnel with Owner's representative.

## 1.10 SPECIFICATION AND DRAWING CONVENTIONS

Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

B. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

1. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

1.11 MISCELLANEOUS PROVISIONS

None.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

# SECTION 012500 - SUBSTITUTION PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes administrative and procedural requirements for substitutions.

A. Related Requirements:
1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

### 1.3 DEFINITIONS

Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

1. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

### 1.4 ACTION SUBMITTALS

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.

Substitution Request Form: Use facsimile of form provided in Project Manual.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.

a. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
b. 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.
c. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
d. Samples, where applicable or requested.
e. Certificates and qualification data, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

m. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

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

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

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:

Requested substitution is consistent with the Contract Documents and will produce indicated results.

a. Requested substitution provides sustainable design characteristics that specified product provided.
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.

Substitutions for Convenience: Not allowed unless otherwise indicated.

B. Substitutions for Cause: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

# SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

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

A. Related Requirements:

Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

### 1.3 MINOR CHANGES IN THE WORK

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

### 1.4 PROPOSAL REQUESTS

Owner-Initiated Proposal Requests: 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.

Work Change Proposal Requests issued by are not instructions either to stop work in progress or to execute the proposed change.

1. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

   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.

a. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
b. Include costs of labor and supervision directly attributable to the change.
c. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
d. Quotation Form: Use forms acceptable to Architect.

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 .

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

## 1.5 CHANGE ORDER PROCEDURES

On Owner's approval of a Work Changes Proposal Request, will issue a Change Order using form SE-380 with signatures of Owner, Architect and Contractor.

## 1.6 CONSTRUCTION CHANGE DIRECTIVE

Construction Work Change Directive: may issue a Construction Work Change Directive on AIA Document G714. Construction Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

Construction Work 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.

Documentation: Maintain detailed records on a time and material basis of work required by the Construction Work Change Directive.

After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

# SECTION 012900 - PAYMENT PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

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

A. Related Requirements:
   1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

### 1.3 DEFINITIONS

Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

### 1.4 SCHEDULE OF VALUES

Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.

Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

Application for Payment forms with continuation sheets.
a. Submittal schedule.
b. Items required to be indicated as separate activities in Contractor's construction schedule.

Sub-schedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values coordinated with each phase of payment.

2. Sub-schedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide sub-schedules showing values coordinated with each element.

Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

Identification: Include the following Project identification on the schedule of values:

Project name and location.
a. Name of Architect.
b. Architect's project number.
c. Contractor's name and address.
d. Date of submittal.

Arrange schedule of values consistent with format of AIA Document G703.

3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

Related Specification Section or Division.
a. Description of the Work.
b. Name of subcontractor.
c. Name of manufacturer or fabricator.
d. Name of supplier.
e. Change Orders (numbers) that affect value.
f. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

Labor.
1) Materials.
2) Equipment.

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.

Include separate line items under Contractor and principal subcontracts for Green Globes documentation and other Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.

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

4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

5. 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.
6. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

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

## 1.5 APPLICATIONS FOR PAYMENT

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.

Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

A. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 AIA Document G702/CMa and AIA Document G703 EJCDC Document C-620 as form for Applications for Payment.

B. Application for Payment Forms: Use forms acceptable to and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.

C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. will return incomplete applications without action.

Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

1. 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.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
3. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.

4. 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.
5. Provide summary documentation for stored materials indicating the following:

Value of materials previously stored and remaining stored as of date of previous Applications for Payment.

a. 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.
b. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

Transmittal: Submit three signed and notarized original copies of each Application for Payment to by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

6. When an application shows completion of an item, submit conditional final or full waivers.

7. Owner reserves the right to designate which entities involved in the Work must submit waivers.
8. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

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.

Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

9. When an application shows completion of an item, submit conditional final or full waivers.
10. Owner reserves the right to designate which entities involved in the Work must submit waivers.
11. 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.
12. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.

Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

List of subcontractors.

13. Schedule of values.
14. Green Globes submittal for project materials cost data.
15. Contractor's construction schedule (preliminary if not final).
16. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
17. Products list (preliminary if not final).
18. Green Globes action plans.
19. Schedule of unit prices.
20. Submittal schedule (preliminary if not final).
21. List of Contractor's staff assignments.
22. List of Contractor's principal consultants.
23. Copies of building permits.
24. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
25. Initial progress report.
26. Report of preconstruction conference.
27. Certificates of insurance and insurance policies.
28. Performance and payment bonds.
29. Data needed to acquire Owner's insurance.

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.

Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

30. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

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:

Evidence of completion of Project closeout requirements.

31. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
32. Updated final statement, accounting for final changes to the Contract Sum.
33. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
34. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
35. AIA Document G707, "Consent of Surety to Final Payment."
36. Evidence that claims have been settled.
37. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
38. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

# SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

General coordination procedures.
1. Coordination drawings.
2. Requests for Information (RFIs).
3. Project Web site.
4. Project meetings.

Related Requirements:
1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
2. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

### 1.3 DEFINITIONS

RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

### 1.4 INFORMATIONAL SUBMITTALS

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:

Name, address, and telephone number of entity performing subcontract or supplying products.
1. Number and title of related Specification Section(s) covered by subcontract.
2. Drawing number and detail references, as appropriate, covered by subcontract.

Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

Post copies of list in project meeting room, in temporary field office, on Project Web site, and by each temporary telephone. Keep list current at all times.

## 1.5 GENERAL COORDINATION PROCEDURES

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.

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.

1. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
2. Make adequate provisions to accommodate items scheduled for later installation.

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.

Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

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:

Preparation of Contractor's construction schedule.

3. Preparation of the schedule of values.
4. Installation and removal of temporary facilities and controls.
5. Delivery and processing of submittals.
6. Progress meetings.
7. Preinstallation conferences.
8. Project closeout activities.
9. Startup and adjustment of systems.

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.

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 COORDINATION DRAWINGS

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.

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:

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.

a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
b. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
c. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
d. Indicate required installation sequences.
e. 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.

Coordination Drawing Organization: Organize coordination drawings as follows:

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:

   Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
   a. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
   b. Fire-rated enclosures around ductwork.

Electrical Work: Show the following:

Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
   c. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
   d. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
   e. Location of pull boxes and junction boxes, dimensioned from column center lines.

Fire-Protection System: Show the following:

Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

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.

7. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

File Preparation Format: DWG, Version AutoCad 2012, operating in Microsoft Windows operating system.

8. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
9. BIM File Incorporation: Construction Manager will incorporate Contractor's coordination drawing files into Building Information Model established for Project.

Construction Manager will perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect.

Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.

a. Digital Data Software Program: Drawings are available in <REVIT 2016.
b. Contractor shall execute a data licensing agreement in the form of AIA Document C106.

## 1.7 REQUESTS FOR INFORMATION (RFIs)

General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.

1. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

Project name.

2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect and Construction Manager.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.

11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

RFI Forms: AIA Document G716 Form bound in Project Manual Software-generated form with substantially the same content as indicated above, acceptable to Architect.

Attachments shall be electronic files in Adobe Acrobat PDF format.

Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

The following Contractor-generated RFIs will be returned without action:

Requests for approval of submittals.

a. Requests for approval of substitutions.
b. Requests for approval of Contractor's means and methods.
c. Requests for coordination information already indicated in the Contract Documents.
d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of Architect's actions on submittals.
f. Incomplete RFIs or inaccurately prepared RFIs.

Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.

14. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

    If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.

RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site.

Project name.

15. Name and address of Contractor.
16. Name and address of Architect and Construction Manager.

17. RFI number including RFIs that were returned without action or withdrawn.
18. RFI description.
19. Date the RFI was submitted.
20. Date Architect's and Construction Manager's response was received.

On receipt of Architect's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.

Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

21. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT WEB SITE

Use Construction Manager's Project Web site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web site shall include the following functions:

Project directory.

1. Project correspondence.
2. Meeting minutes.
3. Contract modifications forms and logs.
4. RFI forms and logs.
5. Task and issue management.
6. Photo documentation.
7. Schedule and calendar management.
8. Submittals forms and logs.
9. Payment application forms.
10. Drawing and specification document hosting, viewing, and updating.
11. Online document collaboration.
12. Reminder and tracking functions.
13. Archiving functions.

Provide up to twelve Project Web site user licenses for use of the Owner, Architect, and Architect's consultants. Provide eight hours of software training at Architect's office for Project Web site users.

B. On completion of Project, provide one complete archive copy(ies) of Project Web site files to Owner and to Architect in a digital storage format acceptable to Architect.

C. Provide one of the following Project Web site software packages under their current published licensing agreements:

Autodesk, Buzzsaw.

1. Autodesk, Constructware.
2. Meridian Systems, Prolog.
3. Mulit-Vista.

Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form of AIA Document C106.

## 1.9 PROJECT MEETINGS

General: Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

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.

1. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
2. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, and Architect, within three days of the meeting.

Preconstruction Conference: Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

Conduct the conference to review responsibilities and personnel assignments.

3. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
4. Agenda: Discuss items of significance that could affect progress, including the following:

   Tentative construction schedule.
   a. Phasing.
   b. Critical work sequencing and long-lead items.
   c. Designation of key personnel and their duties.
   d. Lines of communications.
   e. Procedures for processing field decisions and Change Orders.
   f. Procedures for RFIs.
   g. Procedures for testing and inspecting.
   h. Procedures for processing Applications for Payment.
   i. Distribution of the Contract Documents.
   j. Submittal procedures.
   k. Green Globes requirements for sustainable design..

l. Preparation of record documents.
m. Use of the premises.
n. Work restrictions.
o. Working hours.
p. Owner's occupancy requirements.
q. Responsibility for temporary facilities and controls.
r. Procedures for moisture and mold control.
s. Procedures for disruptions and shutdowns.
t. Construction waste management and recycling.
u. Parking availability.
v. Office, work, and storage areas.
w. Equipment deliveries and priorities.
x. First aid.
y. Security.
z. Progress cleaning.

Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

Green Globes Coordination Conference: Construction Manager will schedule and conduct a Green Globes coordination conference before starting construction, at a time convenient to Owner, Construction Manager, Architect, and Contractors.

Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Construction Manager, Architect, and their consultants; Contractor and its superintendent and Green Globes coordinator; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

5. Agenda: Discuss items of significance that could affect meeting requirements for Green Globes certification, including the following:

   Green Globes Project Checklist.
   a. General requirements for Green Globes related procurement and documentation.
   b. Project closeout requirements and Green Globes certification procedures.
   c. Role of Green Globes Professional coordinator.
   d. Construction waste management.
   e. Construction operations and Green Globes requirements and restrictions.

Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, Construction Manager , and Owner's Commissioning Authority of scheduled meeting dates.

6. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

   Contract Documents.
   a. Options.
   b. Related RFIs.
   c. Related Change Orders.
   d. Purchases.
   e. Deliveries.
   f. Submittals.
   g. Green Globes Sustainable design requirements.
   h. Review of mockups.
   i. Possible conflicts.
   j. Compatibility requirements.
   k. Time schedules.
   l. Weather limitations.
   m. Manufacturer's written instructions.
   n. Warranty requirements.
   o. Compatibility of materials.
   p. Acceptability of substrates.
   q. Temporary facilities and controls.
   r. Space and access limitations.
   s. Regulations of authorities having jurisdiction.
   t. Testing and inspecting requirements.
   u. Installation procedures.
   v. Coordination with other work.
   w. Required performance results.
   x. Protection of adjacent work.
   y. Protection of construction and personnel.

Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

7. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
8. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

Project Closeout Conference: Construction Manager will 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.

Conduct the conference to review requirements and responsibilities related to Project closeout.

9. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority,Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
10. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

    Preparation of record documents.
    a. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    b. Submittal of written warranties.
    c. Requirements for completing Green Globes sustainable design documentation.
    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 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.

Minutes: Entity conducting meeting will record and distribute meeting minutes.

Progress Meetings: Construction Manager will conduct progress meetings at biweekly intervals.

Coordinate dates of meetings with preparation of payment requests.

11. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
12. 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.

Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

Review schedule for next period.

Review present and future needs of each entity present, including the following:

Interface requirements.

1) Sequence of operations.
2) Resolution of BIM component conflicts.
3) Status of submittals.
4) Status of Green Globes 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) Field observations.
14) Status of RFIs.
15) Status of proposal requests.
16) Pending changes.
17) Status of Change Orders.
18) Pending claims and disputes.
19) Documentation of information for payment requests.

Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

Coordination Meetings: Construction Manager will conduct Project coordination meetings at biweekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

13. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined 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.

    a. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

    b. Review present and future needs of each contractor present, including the following:

       Interface requirements.

       1) Sequence of operations.
       2) Resolution of BIM component conflicts.
       3) Status of submittals.
       4) Deliveries.
       5) Off-site fabrication.
       6) Access.
       7) Site utilization.
       8) Temporary facilities and controls.
       9) Work hours.
       10) Hazards and risks.
       11) Progress cleaning.
       12) Quality and work standards.
       13) Change Orders.

Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

# SECTION 013300 - SUBMITTAL PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

A. Related Requirements:

Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.

1. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
3. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

### 1.3 DEFINITIONS

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.

A. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

## 1.4 ACTION SUBMITTALS

Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

1. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

Submit revised submittal schedule to reflect changes in current status and timing for submittals.

Format: Arrange the following information in a tabular format:

Scheduled date for first submittal.

a. Specification Section number and title.
b. Submittal category: Action; informational.
c. Name of subcontractor.
d. Description of the Work covered.
e. Scheduled date for Architect's and Construction Manager's final release or approval.
f. Scheduled date of fabrication.
g. Scheduled dates for purchasing.
h. Scheduled dates for installation.
i. Activity or event number.

## 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.

Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.

Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.

a. Digital Drawing Software Program: The Contract Drawings are available in REVIT 2023.

b. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement.
c. The following digital data files will by furnished for each appropriate discipline:

Floor plans.
1) Reflected ceiling plans.

Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
5. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
6. Resubmittal Review: Allow 15 days for review of each resubmittal.
7. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
8. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

9. Name file with submittal number or other unique identifier, including revision identifier.

   File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.

10. Metadata: Include the following information as keywords in the electronic submittal file metadata:

    Project name.
    a. Number and title of appropriate Specification Section.
    b. Manufacturer name.
    c. Product name.

Options: Identify options requiring selection by Architect.

B. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

C. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

   Note date and content of previous submittal.
   1. Note date and content of revision in label or title block and clearly indicate extent of revision.
   2. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

   Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

D. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's and Construction Manager's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

Post electronic submittals as PDF electronic files directly to Architect's FTP site specifically established for Project.

Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

Submit electronic submittals via email as PDF electronic files.

Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.

a. Provide a notarized statement on original paper copy certificates and certifications where indicated.

Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

Manufacturer's catalog cuts.

a. Manufacturer's product specifications.
b. Standard color charts.
c. Statement of compliance with specified referenced standards.
d. Testing by recognized testing agency.
e. Application of testing agency labels and seals.
f. Notation of coordination requirements.

For equipment, include the following in addition to the above, as applicable:

Wiring diagrams showing factory-installed wiring.

g. Printed performance curves.
h. Operational range diagrams.
i. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

Submit Product Data before or concurrent with Samples.

4. Submit Product Data in the following format:

PDF electronic file.

Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data[, unless submittal based on Architect's digital data drawing files is otherwise permitted].

Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

Identification of products.

a. Schedules.
b. Compliance with specified standards.
c. Notation of coordination requirements.
d. Notation of dimensions established by field measurement.
e. Relationship and attachment to adjoining construction clearly indicated.
f. Seal and signature of professional engineer if specified.

Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least [8-1/2 by 11 inches, but no larger than 30 by 42 inches] <Insert dimensions>.

5. Submit Shop Drawings in the following format:

PDF electronic file.

BIM File Incorporation: Shop Drawing files into Building Information Model established for Project.

Prepare Shop Drawings in the following format: [Same digital data software program, version, and operating system as the original Drawings] [<Insert software name and version>].

a. Refer to Section 013100 "Project Management and Coordination" for requirements for coordination drawings.

Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

6. Identification: Attach label on unexposed side of Samples that includes the following:

   Generic description of Sample.
   a. Product name and name of manufacturer.
   b. Sample source.
   c. Number and title of applicable Specification Section.
   d. Specification paragraph number and generic name of each item.

For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.

7. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

   Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

   Number of Samples: Submit [one] <Insert number> full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

   Number of Samples: Submit sets of Samples. Architect[ and Construction Manager] will retain [two] <Insert number> Sample sets; remainder will be returned.[ Mark up and retain one returned Sample set as a project record sample.]

Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least [three] <Insert number> sets of paired units that show approximate limits of variations.

Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."

B. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

C. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."

D. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

E. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

G. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

I. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

J. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

K. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

L. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

M. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

Name of evaluation organization.
1. Date of evaluation.
2. Time period when report is in effect.
3. Product and manufacturers' names.
4. Description of product.
5. Test procedures and results.
6. Limitations of use.

Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

O. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

P. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Q. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

## 2.2 DELEGATED-DESIGN SERVICES

Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

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

Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

BIM File Incorporation: delegated-design drawing and data files into Building Information Model established for Project.

Prepare delegated-design drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect .

A. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

### 3.2 ARCHITECT'S ACTION

Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

A. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

B. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect .

C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

D. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

# SECTION 014000 - QUALITY REQUIREMENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes administrative and procedural requirements for quality assurance and quality control.

A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

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.

1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
3. Specific test and inspection requirements are not specified in this Section.

### 1.3 DEFINITIONS

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.

A. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.

B. 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.

Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.

1. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

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.

C. 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.

D. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

## 1.4 CONFLICTING REQUIREMENTS

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.

A. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

## 1.5 INFORMATIONAL SUBMITTALS

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:

Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.

1. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

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.

## 1.6 REPORTS AND DOCUMENTS

Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

Date of issue.

1. Project title and number.
2. Name, address, and telephone number of testing agency.
3. Dates and locations of samples and tests or inspections.
4. Names of individuals making tests and inspections.
5. Description of the Work and test and inspection method.
6. Identification of product and Specification Section.
7. Complete test or inspection data.
8. Test and inspection results and an interpretation of test results.

9. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
10. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
11. Name and signature of laboratory inspector.
12. Recommendations on retesting and reinspecting.

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:

Name, address, and telephone number of technical representative making report.

13. Statement on condition of substrates and their acceptability for installation of product.
14. Statement that products at Project site comply with requirements.
15. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
16. Results of operational and other tests and a statement of whether observed performance complies with requirements.
17. Statement whether conditions, products, and installation will affect warranty.
18. Other required items indicated in individual Specification Sections.

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:

Name, address, and telephone number of factory-authorized service representative making report.

19. Statement that equipment complies with requirements.
20. Results of operational and other tests and a statement of whether observed performance complies with requirements.
21. Statement whether conditions, products, and installation will affect warranty.
22. Other required items indicated in individual Specification Sections.

Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## 1.7 QUALITY ASSURANCE

General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

A. 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.

B. 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.

C. 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.

D. 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.

E. 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.

Requirements of authorities having jurisdiction shall supersede requirements for specialists.

Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.

1. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

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.

F. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

G. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

Build mockups in location and of size indicated or, if not indicated, as directed by Architect or Construction Manager.

1. Notify Architect and Construction Manager days in advance of dates and times when mockups will be constructed.
2. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's and Construction Manager's approval of mockups before starting work, fabrication, or construction.

Allow seven days for initial review and each re-review of each mockup.

Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

5. Demolish and remove mockups when directed unless otherwise indicated.

Integrated Exterior Mockups: Construct integrated exterior mockup as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

## 1.8 QUALITY CONTROL

Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

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.

1. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

B. 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.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

1. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
2. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

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:

Access to the Work.

6. Incidental labor and facilities necessary to facilitate tests and inspections.
7. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
8. Facilities for storage and field curing of test samples.
9. Delivery of samples to testing agencies.
10. Preliminary design mix proposed for use for material mixes that require control by testing agency.
11. Security and protection for samples and for testing and inspecting equipment at Project site.

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.

Schedule times for tests, inspections, obtaining samples, and similar activities.

## 1.9 SPECIAL TESTS AND INSPECTIONS

Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:

A. Special Tests and Inspections: Conducted by a qualified special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections[ and in Statement of Special Inspections attached to this Section], and as follows:

Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.

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

PART 2 - |PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

Date test or inspection was conducted.

1. Description of the Work tested or inspected.
2. Date test or inspection results were transmitted to Architect.
3. Identification of testing agency or special inspector conducting test or inspection.

Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and Construction Manager's reference during normal working hours.

3.2 REPAIR AND PROTECTION

General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

Protect construction exposed by or for quality-control service activities.

A. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

# SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

### 1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations.

Water Service: Owner will pay water-service use charges for water used by all entities for construction operations.

Electric Power Service: Owner will pay electric-power-service use charges for electricity used by all entities for construction operations.

Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feethigh with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails.

Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feethigh with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide galvanized-steel bases for supporting posts.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

## 2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

# PART 3 - EXECUTION

## 3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

## 3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities will not be permitted.

D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Install electric power service overhead unless otherwise indicated.
Connect temporary service to Owner's existing power source, as directed by Owner.

E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install telephone line(s) for each field office.

1. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.
Ambulance service.
Contractor's home office.
Contractor's emergency after-hours telephone number.
Architect's office.
Engineers' offices.
Owner's office.
Principal subcontractors' field and home offices.

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

G. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications.

## 3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feetof building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.

Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.

Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.

Remove snow and ice as required to minimize accumulations.

D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

Identification Signs: Provide Project identification signs similar to the standard provided for Phase I, Student Success Center. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

2. Maintain and touchup signs so they are legible at all times.

E. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

## 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

B. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Section 311000 "Site Clearing."

Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to [erosion- and sedimentation-control Drawings] [requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent].

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.

Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.

Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."

Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As indicated on Drawings.

Maintain security by limiting number of keys and restricting distribution to authorized personnel.

D. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

## 3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

Maintenance: Maintain facilities in good operating condition until removal.

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.

B. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

# SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

### 1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations.

Water Service: Owner will pay water-service use charges for water used by all entities for construction operations.

Electric Power Service: Owner will pay electric-power-service use charges for electricity used by all entities for construction operations.

Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feethigh with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails.

Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feethigh with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide galvanized-steel bases for supporting posts.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

## 2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

# PART 3 - EXECUTION

## 3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

## 3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities will not be permitted.

D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Install electric power service overhead unless otherwise indicated.
Connect temporary service to Owner's existing power source, as directed by Owner.

E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install telephone line(s) for each field office.

1. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.
Ambulance service.
Contractor's home office.
Contractor's emergency after-hours telephone number.
Architect's office.
Engineers' offices.
Owner's office.
Principal subcontractors' field and home offices.

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

G. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications.

## 3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feetof building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.

Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.

Remove snow and ice as required to minimize accumulations.

D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

Identification Signs: Provide Project identification signs similar to the standard provided for Phase I, Student Success Center. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

2. Maintain and touchup signs so they are legible at all times.

E. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

## 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

B. Temporary Erosion and Sedimentation Control:

Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to [erosion- and sedimentation-control Drawings] [requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent].

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
   Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
   Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
   Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."

Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As indicated on Drawings.

Maintain security by limiting number of keys and restricting distribution to authorized personnel.

D. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

## 3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

Maintenance: Maintain facilities in good operating condition until removal.

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.

B. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

# SECTION 016000 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

A. Related Requirements:
   1. Section 012500 "Substitution Procedures" for requests for substitutions.

### 1.3 DEFINITIONS

Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.

1. 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.
2. 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.

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.

1.4 ACTION SUBMITTALS

Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

Include data to indicate compliance with the requirements specified in "Comparable Products" Article.

1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

   Form of Approval: As specified in Section 013300 "Submittal Procedures."

   a. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

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

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

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.

A. Delivery and Handling:

Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.

1. 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.
2. 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.
3. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

Storage:

Store products to allow for inspection and measurement of quantity or counting of units.

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

## 1.7 PRODUCT WARRANTIES

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.

Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

1. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

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

Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.

2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

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

# PART 2 - PRODUCTS

## 2.1 PRODUCT SELECTION PROCEDURES

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

Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

1. 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.
2. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
3. Where products are accompanied by the term "as selected," Architect will make selection.
4. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

Product Selection Procedures:

Products:

Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

Manufacturers:

Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

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.

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.

If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

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

Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.

1. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
2. Evidence that proposed product provides specified warranty.
3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
4. Samples, if requested.

# PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

# SECTION 017300 - EXECUTION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
Field engineering and surveying.
Installation of the Work.
Cutting and patching.
Progress cleaning.
Starting and adjusting.
Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
Section 013300 "Submittal Procedures" for submitting surveys.
Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

### 1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

Certified Surveys: Submit two copies signed by [land surveyor] [professional engineer].

Final Property Survey: Submit 2 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, 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

Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.[ Operational elements include the following:]

Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.[ Other construction elements include but are not limited to the following:]

Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.

Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

A. Existing Utility Information: Furnish information to [local utility] [Owner] that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

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.

Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

## 3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

Establish limits on use of Project site.
Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
Inform installers of lines and levels to which they must comply.
Check the location, level and plumb, of every major element as the Work progresses.
Notify Architect when deviations from required lines and levels exceed allowable tolerances.
Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

## 3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

B. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

## 3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.

Allow for building movement, including thermal expansion and contraction.

Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

## 3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

Temporary Support: Provide temporary support of work to be cut.

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.

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 011000 "Summary."

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 prevent interruption to occupied areas.

Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

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.

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 practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

a. Clean piping, conduit, and similar features before applying paint or other finishing materials.

Restore damaged pipe covering to its original condition.

2. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

3. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

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

## 3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.

Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

a. Use containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

C. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## 3.8 STARTING AND ADJUSTING

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

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

## 3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

# SECTION 017419 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

## PART 1 - GENERAL

### 1.1 SUMMARY

Section includes administrative and procedural requirements for the following:

Salvaging nonhazardous construction waste.

1. Recycling nonhazardous construction waste.
2. Disposing of nonhazardous construction waste.

### 1.2 WASTE MANAGEMENT REQUIREMENTS

Owner requires that this project generate the least amount of trash and waste possible

A. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors

B. Minimize trash / waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

C. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incinerations:

Aluminum and plastic beverage containers

1. Corrugated cardboard
2. Wood pallets and crates
3. Clean dimensional wood
4. Land clearing debris, including brush, branches, logs, and stumps: may be chipped and used as mulch as directed by the Landscape Architect or Civil Engineer
5. Clay material on site to be used for making bricks for project: included in early site development contract, but to be included in totals for overall project
6. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill
7. Bricks: May be used on project if whole, or crushed and used as landscape cover, sub-base material or fill
8. Concrete masonry units: May be used on project if whole, or crushed and used as landscape cover, sub-base material or fill
9. Metals, including packaging banding, sheet metal, structural steel, piping, conduit, reinforcing bars, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass and bronze
10. Gypsum drywall and plaster
11. Plastic buckets

12. Carpet, carpet cushion, carpet tile, and carpet remnants: Dupont (http://flooring.dupont.com) and Interface (www.interface.com) conduct reclamation programs
13. Roofing
14. Paint
15. Paper
16. Plastic sheeting and film
17. Batt insulation
18. Acoustical ceiling tile and panels

Green Globes Certification for this project is dependent on diversion of a minimum 50 percent, by weight, of potential landfill trash/waste by recycling and/or salvage.

D. Salvage/Recycle Goals: Owner's goal is to reuse, salvage, and recycle as much nonhazardous demolition and construction waste as possible.

E. Contractor shall submit quarterly Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost of saving accrues; use the same units of measure on all reports.

F. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

G. Methods of trash/waste disposal that are not acceptable are:

Burning on the project site
1. Burying on the project site, except where crushed and approved by Architect to be reused as granular material
2. Dumping or burying on other property, public or private
3. Other illegal dumping or burying
4. Incineration, either on- or off-site

Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

## 1.3 RELATED REQUIREMENTS

Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

A. Section 015000 – Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

B. Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

C. Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and clearing.

D. Section 0118111123 – Sustainable Design Requirements, Green Globes

## 1.4 DEFINITIONS

Clean: untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

A. Construction Demolition Waste: solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

B. Disposal: removal of off-site demolition and construction waste and subsequent sale, recycling, reuse or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e. ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: exhibiting none of the characteristics of hazardous substances, i.e. ignitibility, corrosivity, toxicity or reactivity.

E. Nontoxic: neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: the ability of a product or materials to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: to remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: the process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating or thermally destroying waste.

I. Return: to give back reusable items or unused products to vendors for credit.

J. Reuse: to reuse a construction waste material in some manner on the project site.

K. Salvage: to remove a waste materials from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: the act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: poisonous to humans either immediately or after a long period of exposure.

O. Trash: any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: extra material or material that has reached the end of its useful life in it intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

## 1.5 SUBMITTALS

Submittal Procedures, for submittal procedures.

A. Green Globes Submittals: Submit Landfill Alternatives Proposal, Waste Management Plan, and Waste Disposal Reports in accordance with procedures specified in Section 0118111123.

B. Submit Waste Management Plan within 30 days after receipt of Notice to Proceed, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to land filling.

C. Waste Management Plan: Include the following information:

General: Develop a waste management plan according to ASTM E 1609 and requirements of this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

1. Waste identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

   See Section 017419.01 for Construction Waste Identification Form if no forms are provided by the waste hauler.

Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.

2. Landfill Options: the name address and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvaged, or recycling.
4. List each material proposed to be salvaged, reused, or recycled.
5. List the local market for each material.
6. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
7. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.

8. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.
9. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.

Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

See Section 017419.02 for Construction Waste Reduction Work Plan Form.

10. See Section 017419.03 for Cost/Revenue Analysis of Construction Waste Reduction Work Plan Form.
11. Salvaged Materials for Reuse. For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
12. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
13. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
14. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
15. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility
16. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report

Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.

Update Materials Tracking Spreadsheet for materials that are included in Application for Payment and attach to Application for Payment – Materials summary should be available from waste hauler – if not a summary spreadsheet will be provided.

Submit Report on a form acceptable by Owner.

17. Landfill Disposal: Include the following information

Identification of material

a. Generation point of waste
b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
c. Quantity of waste salvaged both estimated and actual in tons or cubic yards.
d. Quantity of waste recycled both estimated and actual in tons or cubic yards.
e. Total quantity of waste recovered (salvaged and recycled) in tons or cubic yards.
f. Total quantity of waste recovered (salvaged and recycled) as a percentage of total waste.
g. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
h. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

Recycled and Salvaged Materials: Include the following information for each:

Identification of material, including those retrieved by installer or use on other projects.

i. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
j. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material
k. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
l. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

Materials Reused on Project: Include the following information for each:

Identification of material and how it was used in the project

m. Amount, in tons or cubic yards
n. Include weight tickets as evidence of quantity.

Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-project rates for salvage, recycling, and disposal as a percentage of total waste generated by the work.

D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

E. Record of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Landfill Disposal Records: Indicate receipt and acceptance of waste by landfills licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

## PART 2 - PRODUCTS

### 2.1 PRODUCT SUBSTITUTIONS

Product Requirements for substitution submission procedures.
For each proposed product substitution, submit the following information.

Relative amount of waste produced, compared to specific product.

A. Cost savings on waste disposal, compared to specified product, to be deducted from the contract sum

B. Proposed disposal method for waste product.

C. Markets for recycled waste production.

## PART 3 - EXECUTION

### 3.1 WASTE MANAGEMENT PLAN IMPLEMENTATION

General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication

Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, Construction Manager and Architect.

1. Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.

Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

C. Meetings: Discuss trash / waste management goals and issues at project meetings.

Pre-bid meeting
1. Pre-construction meeting
2. Regular job-site meetings

Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.

At a minimum, provide:

Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
a. Separate dumpsters for each category of recyclable.
b. Recycling bins at worker lunch area.

Provide containers as required
3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged
4. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
5. Locate enclosures out of the way of construction traffic.
6. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
7. Provide adequate space for pick-up and delivery and convenience to subcontractors.
8. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
9. Keep recycling and trash / waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

D. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of material and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

E. Reuse of Materials On-Site: Set aside, sort and protect separated products in preparation for reuse.

F. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

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

A. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

B. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at project site to the maximum extent practical according to approved construction waste management plan.

Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each contain and bin.

Inspect containers and bins for contamination and remove contaminated materials if found.

Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile Materials away from construction area. Do not store within drip line of remaining trees.
2. Store components off the ground and protect from the weather.
3. Remove recyclable waste off Owner’s property and transport to recycling receiver or processor.

RECYCLING CONSTRUCTION WASTE

C. Packaging:

Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

1. Pallets: as much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
2. Crates: Break down crate into component wood pieces and comply with requirements for recycling wood.

Site-Clearing Wastes: Chip brush, branches, and trees.

D. Wood Materials:

Clean Cut-Offs of Lumber: Grind or chip into small pieces.

1. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

Gypsum Board:

Stack large clean pieces on wood pallets or in container and store in dry location.

## 3.3 DISPOSAL OF WASTE

General: 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.

Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

Burning: Do not burn waste materials.

B. Disposal: Transportation of waste materials off Owner's property and legally dispose of them, except for items agreed upon by the Owner to be disposed of on site.

## 3.4 ATTACHMENTS

Section 017419.01 – Form CWM-1 For Construction Waste Identification

A. Section 017419.02 – Form CWM-2 for Construction Waste Reduction Work Plan.

B. Section 017419.03 – Form CWM-3 for Cost/Revenue Analysis of Construction Waste Reduction Work Plan.

END OF SECTION 017419

| FORM CWM-1: CONSTRUCTION WASTE IDENTIFICATION | | | | | | | |
|---|---|---|---|---|---|---|---|
| MATERIAL CATEGORY | GENERATION POINT | EST. QUANTITY OF MATERIALS RECEIVED* (A) | EST. WASTE % (B) | TOTAL EST. QUANTITY OF WASTE* (C=AxB) | EST. VOLUME CUBIC YARDS | EST. WEIGHT TONS | REMARKS AND ASSUMPTIONS |
| Packaging: Cardboard | | | | | | | |
| Packaging: Boxes | | | | | | | |
| Packaging: Plastic Sheet or Film | | | | | | | |
| Packaging: Polystyrene | | | | | | | |
| Packaging: Pallets or Skids | | | | | | | |
| Packaging: Crates | | | | | | | |
| Packaging: Paint Cans | | | | | | | |
| Packaging: Plastic Pails | | | | | | | |
| Site-Clearing Waste | | | | | | | |
| Masonry or CMU | | | | | | | |
| Lumber: Cut-Offs | | | | | | | |
| Lumber: Warped Pieces | | | | | | | |
| Plywood or OSB | | | | | | | |
| Wood Forms | | | | | | | |
| Wood Waste Chutes | | | | | | | |
| Wood Trim (cut-offs) | | | | | | | |
| Metals | | | | | | | |
| Insulation | | | | | | | |
| Roofing | | | | | | | |
| Joint Sealant Tubes | | | | | | | |
| Gypsum Board | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (Scraps) | | | | | | | |
| Carpet and Pad (Scraps) | | | | | | | |
| Piping | | | | | | | |
| Electrical Conduit | | | | | | | |
| Other: | | | | | | | |

*Insert unit of measure

**FORM CWM-2: CONTRUCTION WASTE REDUCTION WORK PLAN**

| MATERIAL CATEGORY | GENERATION POINT | TOTAL EST. QUANTITY OF WASTE TONS | DISPOSAL METHOD AND QUANTITY | | | HANDLING AND TRANSPORTATION PROCEDURES |
|---|---|---|---|---|---|---|
| | | | EST. AMOUNT SALVAGED TONS | EST. AMOUNT RECYCLED TONS | EST. AMOUNT DISPOSED TO LANDFILL TONS | |
| Packaging: Cardboard | | | | | | |
| Packaging: Boxes | | | | | | |
| Packaging: Plastic Sheet or Film | | | | | | |
| Packaging: Plystyrene | | | | | | |
| Packaging: Pallets or Skids | | | | | | |
| Packaging: Crates | | | | | | |
| Packaging: Paint Cans | | | | | | |
| Packaging: Plastic Pails | | | | | | |
| Site-Clearing Waste | | | | | | |
| Masonry or CMU | | | | | | |
| Lumber: Cut-Offs | | | | | | |
| Lumber: Warped Pieces | | | | | | |
| Plywood or | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| OSB | | | | | | |
| Wood Forms | | | | | | |
| Wood Waste Chutes | | | | | | |
| Wood Trim (cut-offs) | | | | | | |
| Metals | | | | | | |
| Insulation | | | | | | |
| Roofing | | | | | | |
| Joint Sealant Tubes | | | | | | |
| Gypsum Board (Scraps) | | | | | | |
| Carpet and Pad (Scraps) | | | | | | |
| Piping | | | | | | |
| Electrical Conduit | | | | | | |
| Other: | | | | | | |

**FORM CWM-3: COST/REVENUE ANALYSIS OF CONSTRUCTION WASTE REDUCTION WORK PLAN**

| MATERIAL CATEGORY | TOTAL QUANTITY OF MATERIALS (VOL. OR WEIGHT) (A) | EST. COST OF DISPOSAL (B) | TOTAL EST. COST OF DISPOSAL (C=AxB) | REVENUE FROM SALVAGED MATERIALS (D) | REVENUE FROM RECYCLED MATERIALS (E) | LANDFILL TIPPING FEES AVOIDED (F) | HANDLING AND TRANSPORT COSTS AVOIDED (G) | NET COST SAVINGS OF WORK PLAN (H=D+E+F+G) |
|---|---|---|---|---|---|---|---|---|
| Packaging: Cardboard | | | | | | | | |
| Packaging: Boxes | | | | | | | | |
| Packaging: Plastic Sheet or Film | | | | | | | | |
| Packaging: Polystyrene | | | | | | | | |
| Packaging: Pallets or Skids | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Packaging : Crates | | | | | | | | |
| Packaging : Paint Cans | | | | | | | | |
| Packaging : Plastic Pails | | | | | | | | |
| Site-Clearing Waste | | | | | | | | |
| Masonry or CMU | | | | | | | | |
| Lumber: Cut-Offs | | | | | | | | |
| Lumber: Warped Pieces | | | | | | | | |
| Plywood or OSB | | | | | | | | |
| Wood Forms | | | | | | | | |
| Wood Waste Chutes | | | | | | | | |
| Wood Trim (cut-offs) | | | | | | | | |
| Metals | | | | | | | | |
| Insulation | | | | | | | | |
| Roofing | | | | | | | | |
| Joint Sealant Tubes | | | | | | | | |
| Gypsum Board (Scraps) | | | | | | | | |
| Carpet and Pad (Scraps) | | | | | | | | |
| Piping | | | | | | | | |
| Electrical Conduit | | | | | | | | |
| Other: | | | | | | | | |

# SECTION 017700 - CLOSEOUT PROCEDURES

## PART 1 - GENERAL

### 1.1 SUMMARY

Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

Substantial Completion procedures.

1. Final completion procedures.
2. Warranties.
3. Final cleaning.
4. Repair of the Work.

Related Requirements:

Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

5. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
6. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
7. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

### 1.2 ACTION SUBMITTALS

Product Data: For cleaning agents.

A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

B. Certified List of Incomplete Items: Final submittal at Final Completion.

### 1.3 CLOSEOUT SUBMITTALS

Certificates of Release: From authorities having jurisdiction.

A. Certificate of Insurance: For continuing coverage.

B. Field Report: For pest control inspection.

## 1.4 MAINTENANCE MATERIAL SUBMITTALS

Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

## 1.5 SUBSTANTIAL COMPLETION PROCEDURES

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

A. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

1. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
2. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
3. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.

Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

Submit test/adjust/balance records.

4. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.
5. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

Advise Owner of pending insurance changeover requirements.

6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
7. Complete startup and testing of systems and equipment.
8. Perform preventive maintenance on equipment used prior to Substantial Completion.
9. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
10. Advise Owner of changeover in heat and other utilities.
11. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
12. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

15. Results of completed inspection will form the basis of requirements for final completion.

## 1.6 FINAL COMPLETION PROCEDURES

Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

Submit a final Application for Payment according to Division 01 Section "Payment Procedures."

1. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
3. Submit pest-control final inspection report and warranty.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.

1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
2. Submit list of incomplete items in the following format:

   MS Excel electronic file. Architect will return annotated copy.

## 1.8 SUBMITTAL OF PROJECT WARRANTIES

Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

A. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

1. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
3. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

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 comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

A. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

a. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
b. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
c. Remove tools, construction equipment, machinery, and surplus material from Project site.
d. Remove snow and ice to provide safe access to building.
e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
g. Sweep concrete floors broom clean in unoccupied spaces.
h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
j. Remove labels that are not permanent.
k. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
n. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
o. Leave Project clean and ready for occupancy.

Pest Control: Comply with pest control requirements in Division 01 Section "Temporary Facilities and Controls." Prepare written report.

## 3.2 REPAIR OF THE WORK

Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

A. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

2. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

# SECTION 017823 - OPERATION AND MAINTENANCE DATA

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

Operation and maintenance documentation directory.

1. Emergency manuals.
2. Operation manuals for systems, subsystems, and equipment.
3. Product maintenance manuals.
4. Systems and equipment maintenance manuals.

Related Requirements:

Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

### 1.3 DEFINITIONS

System: An organized collection of parts, equipment, or subsystems united by regular interaction.

A. Subsystem: A portion of a system with characteristics similar to a system.

### 1.4 CLOSEOUT SUBMITTALS

Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

Owner, Architect and Engineers will comment on whether content of operations and maintenance submittals are acceptable.

1. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

Format: Submit operations and maintenance manuals in the following format:

PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.

a. Enable inserted reviewer comments on draft submittals.

Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect, through Construction Manager, will return two copies.

Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.

B. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

## PART 2 - PRODUCTS

### 2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:

List of documents.

1. List of systems.
2. List of equipment.
3. Table of contents.

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.

D. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## 2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

Title page.
1. Table of contents.
2. Manual contents.

Title Page: Include the following information:

Subject matter included in manual.
3. Name and address of Project.
4. Name and address of Owner.
5. Date of submittal.
6. Name and contact information for Contractor.
7. Name and contact information for Architect.
8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
9. Cross-reference to related systems in other operation and maintenance manuals.

Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

B. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

1. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

2. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
3. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.

a. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## 2.3 EMERGENCY MANUALS

Content: Organize manual into a separate section for each of the following:

Type of emergency.
1. Emergency instructions.
2. Emergency procedures.

Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

Fire.
3. Flood.
4. Gas leak.
5. Water leak.
6. Power failure.
7. Water outage.
8. System, subsystem, or equipment failure.
9. Chemical release or spill.

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.

B. Emergency Procedures: Include the following, as applicable:

Instructions on stopping.
1. Shutdown instructions for each type of emergency.
2. Operating instructions for conditions outside normal operating limits.
3. Required sequences for electric or electronic systems.
4. Special operating instructions and procedures.

## 2.4 OPERATION MANUALS

Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
1. Performance and design criteria if Contractor has delegated design responsibility.
2. Operating standards.
3. Operating procedures.
4. Operating logs.
5. Wiring diagrams.
6. Control diagrams.
7. Piped system diagrams.
8. Precautions against improper use.
9. License requirements including inspection and renewal dates.

Descriptions: Include the following:

Product name and model number. Use designations for products indicated on Contract Documents.

10. Manufacturer's name.
11. Equipment identification with serial number of each component.
12. Equipment function.
13. Operating characteristics.
14. Limiting conditions.
15. Performance curves.
16. Engineering data and tests.
17. Complete nomenclature and number of replacement parts.

Operating Procedures: Include the following, as applicable:

Startup procedures.

18. Equipment or system break-in procedures.
19. Routine and normal operating instructions.
20. Regulation and control procedures.
21. Instructions on stopping.
22. Normal shutdown instructions.
23. Seasonal and weekend operating instructions.
24. Required sequences for electric or electronic systems.
25. Special operating instructions and procedures.

Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

B. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## 2.5 PRODUCT MAINTENANCE MANUALS

Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

A. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

B. Product Information: Include the following, as applicable:

Product name and model number.

1. Manufacturer's name.
2. Color, pattern, and texture.
3. Material and chemical composition.

4. Reordering information for specially manufactured products.

Maintenance Procedures: Include manufacturer's written recommendations and the following:

Inspection procedures.
5. Types of cleaning agents to be used and methods of cleaning.
6. List of cleaning agents and methods of cleaning detrimental to product.
7. Schedule for routine cleaning and maintenance.
8. Repair instructions.

Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

C. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

Include procedures to follow and required notifications for warranty claims.

## 2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

A. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

B. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

Standard maintenance instructions and bulletins.
1. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
2. Identification and nomenclature of parts and components.
3. List of items recommended to be stocked as spare parts.

Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

Test and inspection instructions.
4. Troubleshooting guide.

5. Precautions against improper maintenance.
6. Disassembly; component removal, repair, and replacement; and reassembly instructions.
7. Aligning, adjusting, and checking instructions.
8. Demonstration and training video recording, if available.

Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.

9. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

C. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

D. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

Include procedures to follow and required notifications for warranty claims.

## PART 3 - EXECUTION

### 3.1 MANUAL PREPARATION

Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance 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. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.

1. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

Do not use original project record documents as part of operation and maintenance manuals.

2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

# SECTION 017839 - PROJECT RECORD DOCUMENTS

## PART 1 - GENERAL

### 1.1 SUMMARY

Section includes administrative and procedural requirements for project record documents, including the following:

Record Drawings.

1. Record Specifications.
2. Record Product Data.

Related Requirements:

Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

3. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

### 1.2 CLOSEOUT SUBMITTALS

Record Drawings: Comply with the following:

Number of Copies: Submit copies of record Drawings as follows:

Initial Submittal:

Submit PDF electronic files of scanned record prints and one set of file prints.

1) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

Final Submittal:

Submit PDF electronic files of scanned record prints and one set of prints.

2) Print each drawing, whether or not changes and additional information were recorded.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.

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.

Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

a. Record data as soon as possible after obtaining it.
b. Record and check the markup before enclosing concealed installations.

Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
3. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

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.

4. Format: Annotated PDF electronic file with comment function enabled.
5. 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.
6. Identification: As follows:

Project name.

a. Date.
b. Designation "PROJECT RECORD DRAWINGS."
c. Name of Architect.
d. Name of Contractor.

## 2.2 MISCELLANEOUS RECORD SUBMITTALS

Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

A. Format: Submit miscellaneous record submittals as PDF electronic file.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

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 purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

# SECTION 017900 - DEMONSTRATION AND TRAINING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

Demonstration of operation of systems, subsystems, and equipment.

1. Training in operation and maintenance of systems, subsystems, and equipment.
2. Demonstration and training video recordings.

### 1.3 INFORMATIONAL SUBMITTALS

Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

Attendance Record: For each training module, submit list of participants and length of instruction time.

### 1.4 CLOSEOUT SUBMITTALS

Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.

Identification: On each copy, provide an applied label with the following information:

Name of Project.

a. Name and address of videographer.
b. Name of Architect.
c. Name of Construction Manager.

d. Name of Contractor.
e. Date of video recording.

At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals and in PDF electronic file format on compact disc.

## 1.5 QUALITY ASSURANCE

Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

B. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

Inspect and discuss locations and other facilities required for instruction.
1. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
2. Review required content of instruction.
3. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

## 1.6 COORDINATION

Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

A. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

A. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

Basis of System Design, Operational Requirements, and Criteria: Include the following:

System, subsystem, and equipment descriptions.

a. Performance and design criteria if Contractor is delegated design responsibility.
b. Operating standards.
c. Regulatory requirements.
d. Equipment function.
e. Operating characteristics.
f. Limiting conditions.
g. Performance curves.

Documentation: Review the following items in detail:

Emergency manuals.

h. Operations manuals.
i. Maintenance manuals.
j. Project record documents.
k. Identification systems.
l. Warranties and bonds.
m. Maintenance service agreements and similar continuing commitments.

Emergencies: Include the following, as applicable:

Instructions on meaning of warnings, trouble indications, and error messages.

n. Instructions on stopping.
o. Shutdown instructions for each type of emergency.
p. Operating instructions for conditions outside of normal operating limits.
q. Sequences for electric or electronic systems.
r. Special operating instructions and procedures.

Operations: Include the following, as applicable:

Startup procedures.

s. Equipment or system break-in procedures.
t. Routine and normal operating instructions.
u. Regulation and control procedures.
v. Control sequences.
w. Safety procedures.
x. Instructions on stopping.
y. Normal shutdown instructions.
z. Operating procedures for emergencies.
aa. Operating procedures for system, subsystem, or equipment failure.
bb. Seasonal and weekend operating instructions.
cc. Required sequences for electric or electronic systems.
dd. Special operating instructions and procedures.

Adjustments: Include the following:

Alignments.

ee. Checking adjustments.
ff. Noise and vibration adjustments.
gg. Economy and efficiency adjustments.

Troubleshooting: Include the following:

Diagnostic instructions.

hh. Test and inspection procedures.

Maintenance: Include the following:

Inspection procedures.

ii. Types of cleaning agents to be used and methods of cleaning.
jj. List of cleaning agents and methods of cleaning detrimental to product.
kk. Procedures for routine cleaning
ll. Procedures for preventive maintenance.
mm. Procedures for routine maintenance.
nn. Instruction on use of special tools.

Repairs: Include the following:

Diagnosis instructions.

oo. Repair instructions.
pp. Disassembly; component removal, repair, and replacement; and reassembly instructions.
qq. Instructions for identifying parts and components.
rr. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

A. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.

1. Owner will furnish an instructor to describe Owner's operational philosophy.
2. Owner will furnish Contractor with names and positions of participants.

Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

Schedule training with Owner with at least seven days' advance notice.

Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

B. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

C. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

At beginning of each training module, record each chart containing learning objective and lesson outline.

Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to Owner, on electronic media.

Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.

1. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
2. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
3. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:

   Name of Contractor/Installer.
   a. Business address.
   b. Business phone number.
   c. Point of contact.
   d. E-mail address.

Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.

Film training session(s) in segments not to exceed 15 minutes.

Produce segments to present a single significant piece of equipment per segment.
   e. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
   f. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

Furnish additional portable lighting as required.

Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

B. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION 017900

# SECTION 024119 - SELECTIVE DEMOLITION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.

Section 017300 "Execution" for cutting and patching procedures.

### 1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

### 1.4 MATERIALS OWNERSHIP

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

Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

## 1.5 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.

Review structural load limitations of existing structure.
Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
Review areas where existing construction is to remain and requires protection.
Review exterior metal panel condition and strategies for maintaining integrity of building envelope.

## 1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property , for environmental protection. Indicate proposed locations and construction of barriers.

B. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

## 1.7 CLOSEOUT SUBMITTALS

A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

## 1.8 FIELD CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:

a. Donor Gifts and recognitions
b. Artwork.
Furniture and equipment.
Staff's personal effects.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.

If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

Storage or sale of removed items or materials on-site is not permitted.

Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

2. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner's Representative will arrange to shut off indicated services/systems when requested by Contractor.

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.

Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated 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.

Equipment to Be Removed: Disconnect and cap services and remove equipment.

Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

B. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

## 3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

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.

Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

Cover and protect furniture, furnishings, and equipment that have not been removed.

Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

## 3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

Maintain adequate ventilation when using cutting torches.

Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.

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

## 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.

Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

## 3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.

Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

Disposal: Transport demolished materials off Owner's property and legally dispose of them.

## 3.7 CLEANING

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

END OF SECTION 024119

# SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

### 1.2 ACTION SUBMITTALS

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

B. Design Mixtures: For each concrete mixture.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

### 1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Material certificates.

C. Material test reports.

D. Floor surface flatness and levelness measurements.

### 1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

F. Preinstallation Conference: Conduct conference at Project site.

## PART 2 - PRODUCTS

### 2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

### 2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice.

### 2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I or Type III, gray[ Supplement with the following:

a. Fly Ash: ASTM C 618, Class F or C.

B. Normal-Weight Aggregates: ASTM C 33, graded.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

## 2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing 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.

## 2.5 FIBER REINFORCEMENT

A. Synthetic Micro-Fiber: 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 (13 to 38 mm) long.

## 2.6 WATERSTOPS

A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

B. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

C. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch (10 by 19 mm).

## 2.7 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.

## 2.8 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

## 2.9 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

## 2.10 CONCRETE MIXTURES

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not more than 25 percent.

C. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

D. Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3000psi (20.7 MPa) for foundations, 4000 psi (27.6 MPa) for all other concrete, at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 4 inches (100 mm) or 8 inches (200 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch (25-mm) nominal maximum aggregate size, except for trowel-finished floors.
5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
6. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m).

## 2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M[ and ASTM C 1116/C 1116M], and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

# PART 3 - EXECUTION

## 3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Chamfer exterior corners and edges of permanently exposed concrete.

## 3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

## 3.3 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

## 3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

## 3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

E. Waterstops: Install in construction joints and at other joints indicated according to manufacturer's written instructions.

## 3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Cold-Weather Placement: Comply with ACI 306.1.

D. Hot-Weather Placement: Comply with ACI 301.

## 3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. May apply to concrete surfaces not exposed to view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

## 3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated and where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

## 3.9 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

    a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. 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.

## 3.10 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

## 3.11 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

END OF SECTION 03 30 00

# SECTION 040120.63 - BRICK MASONRY REPAIR

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Repairing brick masonry, including replacing units.

1. Reuse of existing brick – clean for reuse.

### 1.3 DEFINITIONS

Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

A. Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of masonry units to freezing and thawing.

### 1.4 PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at Project site.

Review methods and procedures related to brick masonry repair including, but not limited to, the following:

Verify brick masonry repair specialist's personnel, equipment, and facilities needed to make progress and avoid delays.

a. Materials, material application, sequencing, tolerances, and required clearances.
b. Quality-control program.

### 1.5 Coordination with building occupants SEQUENCING AND SCHEDULING

Work Sequence: Perform brick masonry repair work in the following sequence, which includes work specified in this and other Sections:

Remove plant growth.

1. Inspect masonry for open mortar joints and point them before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
2. Remove paint.
3. Clean masonry.
4. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
5. Repair masonry, including replacing existing masonry with new masonry materials.
6. Rake out mortar from joints to be repointed.
7. Point mortar and sealant joints.
8. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
9. Where water repellents are to be used on or near masonry work, delay application of these chemicals until after pointing and cleaning.

## 1.6 ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

1. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.

Samples for Initial Selection: For the following:

Colored Mortar: Submit sets of mortar that will be left exposed in the form of sample mortar strips, 6 inches long by 1/4 inch wide, set in aluminum or plastic channels.

New mortar to match existing mortar on building.

Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching existing, cleaned mortar when cured and dry.

a. Submit with precise measurements on ingredients, proportions, gradations, and source of colored sands from which each Sample was made.

Sand Types Used for Mortar: Minimum 8 oz. of each in plastic screw-top jars.

2. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of masonry representative of the range of masonry colors on the building.

New mortar to match existing mortar on building.

Have each set contain a close color range of at least three Samples of different mixes of patching compound that matches the variations in existing masonry when cured and dry.

Include similar Samples of accessories involving color selection.

Samples for Verification: For the following:

Each type of brick unit to be used for replacing existing units. Include sets of Samples to show the full range of shape, color, and texture to be expected. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range.

3. Each type of patching compound in the form of briquettes, at least 3 inches long by 1-1/2 inches wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.
4. Accessories: Each type of accessory and miscellaneous support.

## 1.7 INFORMATIONAL SUBMITTALS

Qualification Data: For brick masonry repair specialist.

## 1.8 QUALITY ASSURANCE

Brick Masonry Repair Specialist Qualifications: Engage an experienced brick masonry repair firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work.

Field Supervision: Brick masonry repair specialist firm shall maintain experienced full-time supervisors on Project site during times that brick masonry repair work is in progress.

1. Brick Masonry Repair Worker Qualifications: When masonry units are being patched, assign at least one worker per crew who is trained and certified by manufacturer of patching compound to apply its products.

Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage.

## 1.9 DELIVERY, STORAGE, AND HANDLING

Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons and protected against impact and chipping.

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.

C. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

D. Store sand where grading and other required characteristics can be maintained and contamination avoided.

E. Handle masonry units to prevent overstressing, chipping, defacement, and other damage.

## 1.10 FIELD CONDITIONS

Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.

A. Temperature Limits, General: Repair masonry units only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated.

B. Cold-Weather Requirements: Comply with the following procedures for masonry repair unless otherwise indicated:

When air temperature is below 40 deg F, heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F.

1. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for seven days after repair.

Hot-Weather Requirements: Protect masonry repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

C. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

Source Limitations: Obtain each type of material for repairing brick masonry (brick, cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MASONRY MATERIALS

Face Brick: As required to complete brick masonry repair work.

Brick Matching Existing: Units with colors, color variation within units, surface texture, size, and shape that match existing brickwork and with physical properties within 10 percent of those determined from preconstruction testing of selected existing units.

For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.

Special Shapes:

Provide molded, 100 percent solid shapes for applications where core holes or "frogs" could be exposed to view or weather when in final position and where shapes produced by sawing would result in sawed surfaces being exposed to view.

a. Provide specially ground units, shaped to match patterns, for arches and where indicated.
b. Mechanical chopping or breaking brick, or bonding pieces of brick together by adhesive, are unacceptable procedures for fabricating special shapes.

Tolerances as Fabricated: According to tolerance requirements in ASTM C 216, Type FBX.

2.3 ACCESSORY MATERIALS

Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

Minimal possibility of damaging exposed surfaces.

1. Uniformity of the resulting overall appearance.
2. Do not use products or tools that could leave residue on surfaces.

PART 3 - EXECUTION

3.1 REPAIR SPECIALIST

Brick Masonry Repair Specialist Firms: Subject to compliance with requirements, firms that may perform masonry repair include, but are not limited to, the following:

Southeast Restoration
1. Metro Waterproofing

3.2 PROTECTION

Prevent mortar from staining face of surrounding masonry and other surfaces.

Cover sills, ledges, and other projecting items to protect them from mortar droppings.
1. Keep wall area wet below rebuilding and repair work to discourage mortar from adhering.
2. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.

Remove downspouts and associated hardware adjacent to masonry and store during masonry repair. Reinstall when repairs are complete.

Provide temporary rain drainage during work to direct water away from building.

3.3 MASONRY REPAIR, GENERAL

Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect.

3.4 BRICK REMOVAL AND REPLACEMENT

At locations indicated, remove bricks that are damaged, spalled, or deteriorated. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

When removing single bricks, remove material from center of brick and work toward outside edges.

Support and protect remaining masonry that surrounds removal area.

A. Maintain, replace or add new flashing, reinforcement, lintels, and adjoining construction in an undamaged condition. Coordinate with new flashing, reinforcement, and lintels, which are specified in other Sections.

B. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

C. Remove in an undamaged condition as many whole bricks as possible.

Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.

1. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
2. Store brick for reuse. Store off ground, on skids, and protected from weather.
3. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.

Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.

D. Replace removed damaged brick with other removed brick in good condition, where possible, or with new brick matching existing brick. Do not use broken units unless they can be cut to usable size.

E. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

Maintain joint width for replacement units to match existing joints.

1. Use setting buttons or shims to set units accurately spaced with uniform joints.

Lay replacement brick 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 bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.

2. Rake out mortar used for laying brick before mortar sets according to Section 040120.64 "Brick Masonry Repointing." Point at same time as repointing of surrounding area.
3. When mortar is hard enough to support units, remove shims and other devices interfering with pointing of joints.

Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.

Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

## 3.5 FINAL CLEANING

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.

Do not use metal scrapers or brushes.

1. Do not use acidic or alkaline cleaners.

Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.

B. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

C. Remove masking materials, leaving no residues that could trap dirt.

## 3.6 MASONRY WASTE DISPOSAL

Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property.

A. Masonry Waste: Remove masonry waste and legally dispose of off Owner's property.

END OF SECTION 040120.63

# SECTION 055000 - METAL FABRICATIONS

## PART 1 - GENERAL

### 1.1 SUMMARY

Section Includes:

Miscellaneous steel framing and supports.

1. Loose bearing and leveling plates.

Products furnished, but not installed, under this Section include the following:

Loose steel lintels.

2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

### 1.2 ACTION SUBMITTALS

Product Data: For the following:

1. Paint products.
2. Grout.

Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

B. Samples for Verification: For each type and finish of extruded nosing and tread.

Delegated-Design Submittal: For ladders, including analysis data signed and sealed by the qualified professional engineer licensed in the state of South Carolina responsible for their preparation.

### 1.3 PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders.

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.

Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.4 METALS

Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

C. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

D. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

E. Zinc-Coated Steel Wire Rope: ASTM A 741.

Wire-Rope Fittings: Hot-dip galvanized-steel connectors with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

Size of Channels: 1-5/8 by 1-5/8 inchess indicated.
1. Material: Galvanized steel, ASTM A 653/A 653M, structural steel, Grade 33], with G90 coating; 0.108-inch nominal thickness.

Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

F. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

G. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

H. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

I. Bronze Extrusions: ASTM B 455, Alloy UNS No. C38500 (extruded architectural bronze).

J. Bronze Castings: ASTM B 584, Alloy UNS No. C83600 (leaded red brass) or No. C84400 (leaded semired brass).

K. Nickel Silver Castings: ASTM B 584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

## 1.5 FASTENERS

General: Unless otherwise indicated, provide Type 304 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.

Provide stainless-steel fasteners for fastening aluminum.

1. Provide stainless-steel fasteners for fastening stainless steel.
2. Provide stainless-steel fasteners for fastening nickel silver.
3. Provide bronze fasteners for fastening bronze.

Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

B. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

## 1.6 MISCELLANEOUS MATERIALS

Shop Primers: Provide primers that comply with Section 099123 Interior Painting."

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.

B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

## 1.7 FABRICATION, GENERAL

Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

A. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

B. Weld corners and seams continuously to comply with the following:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

1. Obtain fusion without undercut or overlap.
2. Remove welding flux immediately.
3. At exposed connections, finish exposed welds and surfaces smooth and blended.

Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

C. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

D. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 8 inches from ends and corners of units and 24 inches o.c.

## 1.8 MISCELLANEOUS FRAMING AND SUPPORTS

General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

A. 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.

## 1.9 MISCELLANEOUS STEEL TRIM

Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

A. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

B. Galvanize exterior miscellaneous steel trim unless otherwise indicated.

C. Prime exterior ]miscellaneous steel trim with primer specified in Section 099600 "High-Performance Coatings.", where indicated.

## 1.10 LOOSE BEARING AND LEVELING PLATES

Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

## 1.11 LOOSE STEEL LINTELS

Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.

A. Galvanize loose steel lintels located in exterior walls.

## 1.12 STEEL WELD PLATES AND ANGLES

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.

## 1.13 FINISHES, GENERAL

Finish metal fabrications after assembly.

## 1.14 STEEL AND IRON FINISHES

Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

A. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

Shop prime with primers specified in Section 099600 "High-Performance Coatings" .

Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

1. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Other Items: SSPC-SP 3, "Power Tool Cleaning."

Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

## PART 2 - EXECUTION

### 2.1 INSTALLATION, GENERAL

Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

A. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

B. Field Welding: Comply with the following requirements:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

1. Obtain fusion without undercut or overlap.
2. Remove welding flux immediately.
3. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

## 2.2 INSTALLING BEARING AND LEVELING PLATES

Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

A. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

## 2.3 ADJUSTING AND CLEANING

Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

# SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Wood blocking and nailers.

1. Plywood backing panels.

### 1.3 DEFINITIONS

Boards or Strips: Lumber of less than 2 inches nominalsize in least dimension.

A. Dimension Lumber: Lumber of 2 inches nominalor greater size but less than 5 inches nominalsize in least dimension.

### 1.4 ACTION SUBMITTALS

Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

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.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
2. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

Evaluation Reports: For the following, from ICC-ES:

Preservative-treated wood.
1. Power-driven fasteners.
2. Post-installed anchors.
3. Metal framing anchors.

1.6 QUALITY ASSURANCE

Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

Factory mark each piece of lumber with grade stamp of grading agency.
1. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
2. Dress lumber, S4S, unless otherwise indicated.

Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

1. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

B. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

For exposed lumber indicated to receive a stained or natural finish, [mark end or back of each piece] [or] [omit marking and provide certificates of treatment compliance issued by inspection agency].

Application: Treat items indicated on Drawings, and the following:

Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

1. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.

## 2.3 MISCELLANEOUS LUMBER

General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

Blocking.

1. Nailers.

Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:

Mixed southern pine or southern pine; SPIB.

2. Spruce-pine-fir; NLGA.
3. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

B. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

## 2.4 PLYWOOD BACKING PANELS

Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, [fire-retardant treated,] in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

## 2.5 FASTENERS

General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fastenersof Type 304 stainless steel.

Nails, Brads, and Staples: ASTM F 1667.

A. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.

B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

## 2.6 MISCELLANEOUS MATERIALS

Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

# PART 3 - EXECUTION

## 3.1 INSTALLATION, GENERAL

Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

C. |Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

D. Do not splice structural members between supports unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 incheso.c.

Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

1. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 incheso.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominalthickness.

Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

F. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

Use inorganic boron for items that are continuously protected from liquid water.

1. Use copper naphthenate for items not continuously protected from liquid water.

Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

G. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

1. ICC-ES evaluation report for fastener.

Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

## 3.2 WOOD BLOCKING AND NAILER INSTALLATION

Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

A. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

## 3.3 PROTECTION

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

A. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

# SECTION 064116 – PLASTIC LAMINATE-FACED ARCHITECTURAL CABINETS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section Includes:

1. Plastic-laminate-faced architectural cabinets.

Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets and concealed within other construction before cabinet installation.

Solid Surface Countertops – refer to drawings.

### 1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including panel products high-pressure decorative laminate adhesive for bonding plastic laminate.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.

Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
Show locations and sizes of cutouts and holes for electrical switches and outlets and other itemsinstalled in architectural plastic-laminate cabinets.
Apply WI Certified Compliance Program label to Shop Drawings.
Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Initial Selection:

1. Plastic laminates.
2. PVC edge material.
3. Thermoset decorative panels.

D. Samples for Verification:

1. Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish, with one sample applied to core material and specified edge material applied to one edge.

2. Wood-grain plastic laminates, 12 by 24 inches, for each type, pattern and surface finish, with one sample applied to core material and specified edge material applied to one edge.

3. Thermoset decorative panels, 8 by 10 inches, for each color, pattern, and surface finish, with edge banding on one edge.

4. Corner pieces as follows:

a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 incheshigh by 18 incheswide by 6 inchesdeep.

Miter joints for standing trim.

## 1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and fabricator.

Product Certificates: For the following:

1. Composite wood and agrifiber products.

Thermoset decorative panels.
High-pressure decorative laminate.
Adhesives.

B. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

## 1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.

Installer Qualifications: Fabricator of products.

Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of typical plastic-laminate cabinets as shown on Drawings.

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. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

## 1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.

B. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

## 1.9 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

Hardware Coordination: Distribute copies of approved hardware schedule specified in Section 087111 "Door Hardware (Descriptive Specification)" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

# PART 2 - PRODUCTS

## 2.1 ARCHITECTURAL CABINET FABRICATORS

A. Fabricators: Subject to compliance with requirements, available fabricators offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Satterfield Woodworking, Inc.; 1727 Poplar Drive Ext., Greer, South Carolina, 29651
2. OnSite Woodwork Corporation, 645-E Pressley Road, Charlotte, NC
3. Custom Architectural Solutions
4. Woodco, Inc., Piedmont SC
5. IOPC USA, Greer SC

## 2.2 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

B. Grade: Custom.

Type of Construction: Frameless.

Cabinet, Door, and Drawer Front Interface Style: Flush overlay.

High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. BOD: refer to drawings - POLILAM
   b. Abet Laminati, Inc.
   c. Formica Corporation.
   d. Lamin-Art, Inc.
   e. Wilsonart International; Div. of Premark International, Inc.

C. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.
Postformed Surfaces: Grade HGP.
Vertical Surfaces: Grade VGS.
Edges: PVC edge banding, 0.12 inchthick, matching laminate in color, pattern, and finish.
Pattern Direction: As indicated.

D. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade CLS.

   a. Edges of Plastic-Laminate Shelves: PVC tape, 0.018-inchminimum thickness, matching laminate in color, pattern, and finish.

   Edges of Thermoset Decorative Panel Shelves: PVC or polyester edge banding.
   For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.

2. Drawer Sides and Backs: Solid-hardwood lumber.
Drawer Bottoms: Hardwood plywood.

E. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As selected by Architect from laminate manufacturer's premium range.

## 2.3 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Wood Moisture Content: 8 to 13 percent.

B. Composite Wood: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard: ANSI A208.2, .

Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

## 2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087111 "Door Hardware (Descriptive Specification)."

Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.

Wire Pulls: Back mounted, solid metal, 5 incheslong, 1-1/2 inchesdeep, and 5/16 inchin diameter.

Catches: Magnetic catches, BHMA A156.9, B03141.

Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.

Drawer Slides: BHMA A156.9.

1. Grade 1: Side mounted; full-extension type; epoxy-coated steel with polymer rollers.

Grade 1HD-100 and Grade 1HD-200: Side mounted; full-extension type; zinc-plated-steel ball-bearing slides.

For drawers not more than 3 inches high and not more than 24 inches wide, provide Grade 1.

For drawers more than 3 incheshigh but not more than 6 incheshigh and not more than 24 incheswide, provide Grade 1.
For drawers more than 6 incheshigh or more than 24 incheswide, provide Grade 1HD-200.
For computer keyboard shelves, provide Grade 1.

B. Door Locks: BHMA A156.11, E07121.

Drawer Locks: BHMA A156.11, E07041.

Door and Drawer Silencers: BHMA A156.16, L03011.

Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.

Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
Satin Stainless Steel: BHMA 630.

C. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

## 2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

Adhesives: Do not use adhesives that contain urea formaldehyde.

Adhesive for Bonding Plastic Laminate: Unpigmented contact cement .

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

## 2.6 FABRICATION

A. Fabricate cabinets to dimensions, profiles, and details indicated.

Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.

Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

B. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

Before installing cabinets, examine shop-fabricated work for completion and complete work as required.

### 3.2 INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.

Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.

1. Use filler matching finish of items being installed.

B. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inchsag, bow, or other variation from a straight line.

Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 incheso.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inchpenetration into wood framing, blocking, or hanging strips No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

## 3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

Clean, lubricate, and adjust hardware.

Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION 064116

# SECTION 072100 - THERMAL INSULATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Glass-fiber blanket.

1. Where required for exterior modification work.
2. Sound Attenuation Blankets – interior walls and ceilings as indicated.

Related Requirements:

3. Section 092900 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

### 1.3 ACTION SUBMITTALS

Product Data: For each type of product.

### 1.4 INFORMATIONAL SUBMITTALS

Product Test Reports: For each product, for tests performed by a qualified testing agency.

A. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

### 1.5 DELIVERY, STORAGE, AND HANDLING

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.

## PART 2 - PRODUCTS

## 2.1 GLASS-FIBER BLANKET

Sustainability Requirements: Provide glass-fiber blanket insulation as follows:

Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.

1. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

Glass-Fiber Blanket, Unfaced : ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

Guardian Building Products, Inc.

a. Johns Manville; a Berkshire Hathaway company.
b. Knauf Insulation.
c. Owens Corning.

B. Sound Attenuation Blankets

1. Basis of Design: Sound Shield Formaldehyde-Free Fiberglas Insulation, manufactured by Johns Manville.
   a. STC rating: minimum of 48.
   b. Unfaced.
   c. Wall and Ceiling installation as indicated.
   d. Thickness as required to obtain STC rating.

## 2.2 ACCESSORIES

Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

# PART 3 - EXECUTION

## 3.1 PREPARATION

Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

## 3.2 INSTALLATION, GENERAL

Comply with insulation manufacturer's written instructions applicable to products and applications.

A. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

B. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

C. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

## 3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.

1. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
2. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
3. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

## 3.4 PROTECTION

Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

# SECTION 076200 - SHEET METAL FLASHING AND TRIM

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Formed low-slope roof sheet metal fabrications – prefabricated metal canopies.

Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

### 1.3 PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at Project site.

Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
2. Review requirements for insurance and certificates if applicable.
3. Review sheet metal flashing observation and repair procedures after flashing installation.

### 1.4 ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

Shop Drawings: For sheet metal flashing and trim.

Include plans, elevations, sections, and attachment details.

1. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
2. Include identification of material, thickness, weight, and finish for each item and location in Project.
3. Include details for forming, including profiles, shapes, seams, and dimensions.
4. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
5. Include details of termination points, expansion joint and assemblies.
6. Include details of special conditions.
7. Include details of connections to adjoining work.
8. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches.

Samples for Verification: For each type of exposed finish.

Sheet Metal Flashing: 12 incheslong by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.

9. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 incheslong and in required profile. Include fasteners and other exposed accessories.
10. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

## 1.5 INFORMATIONAL SUBMITTALS

Qualification Data: For fabricator.

A. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested .

B. Sample Warranty: For special warranty.

## 1.6 CLOSEOUT SUBMITTALS

Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

## 1.7 QUALITY ASSURANCE

Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

## 1.8 DELIVERY, STORAGE, AND HANDLING

Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

A. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

## 1.9 WARRANTY

Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

Color fading more than 5 Hunter units when tested according to ASTM D 2244.

a. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
b. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Finish Warranty Period: 20 years from date of Substantial Completion.

# PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

A. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

B. SPRI Wind Design Standard: Manufacture and install copings tested according to SPRI ES-1 and capable of resisting the following design pressure:

Design Pressure: As indicated on Drawings.

Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## 2.2 SHEET METALS

General: Protect finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

A. Aluminum Sheet: ASTM B 209 , alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

Exposed Coil-Coated Finish:

Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

Metallic-Coated Steel Sheet: Provide or ; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

Surface: Smooth, flat.

1. Color: As indicated by manufacturer's designations.
2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil..

Metallic-Coated Steel Sheet: Provide ; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

Surface: Smooth, flat.

3. Color: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color>.
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

## 2.3 MISCELLANEOUS MATERIALS

General: Provide materials and types of fasteners[, solder], protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

A. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.

a. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
b. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

Solder:

For Stainless Steel: ASTM B 32, [Grade Sn60] [Grade Sn96], with acid flux of type recommended by stainless-steel sheet manufacturer.

Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inchwide and 1/8 inchthick.

B. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

D. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

E. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

## 2.4 FABRICATION, GENERAL

General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

1. Obtain field measurements for accurate fit before shop fabrication.
2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inchoffset of adjoining faces and of alignment of matching profiles.

B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

Form expansion joints of intermeshing hooked flanges, not less than 1 inchdeep, filled with butyl sealant concealed within joints.

1. Use lapped expansion joints only where indicated on Drawings.

Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

C. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

D. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

E. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

F. Do not use graphite pencils to mark metal surfaces.

## 2.5 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

Copings: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, solder or weld watertight. Shop fabricate interior and exterior corners.

Joint Style: Butted with expansion space and 6-inch-wide, concealed backup plate.

1. Fabricate from the Following Materials:

Aluminum: 0.050 inch thick.

Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

Aluminum: 0.040 inch thick.

Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

Aluminum: 0.032 inch thick.

Flashing Receivers: Fabricate from the following materials:

Aluminum: 0.032 inch thick.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

Verify compliance with requirements for installation tolerances of substrates.

1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
2. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 UNDERLAYMENT INSTALLATION

Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inchesstaggered 24 inchesbetween courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

A. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

## 3.3 INSTALLATION, GENERAL

General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

1. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
2. Space cleats not more than 12 inchesapart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
4. Torch cutting of sheet metal flashing and trim is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

Coat concealed side of uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.

6. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inchesof corner or intersection.

Form expansion joints of intermeshing hooked flanges, not less than 1 inchdeep, filled with sealant concealed within joints.

7. Use lapped expansion joints only where indicated on Drawings.

Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

B. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

C. Seal joints as required for watertight construction.

Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inchinto sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.

1. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.

Do not solder metallic-coated steel and aluminum sheet.

2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

Rivets: Rivet joints in uncoated aluminum where necessary for strength.

## 3.4 ROOF FLASHING INSTALLATION

General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

A. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inchesover base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.

E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

## 3.5 MISCELLANEOUS FLASHING INSTALLATION

Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

## 3.6 ERECTION TOLERANCES

Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inchoffset of adjoining faces and of alignment of matching profiles.

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

## 3.7 CLEANING AND PROTECTION

Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

A. Clean and neutralize flux materials. Clean off excess solder.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

# SECTION 078413 - PENETRATION FIRESTOPPING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Penetrations in fire-resistance-rated walls.

1. Penetrations in horizontal assemblies.
2. Intumescent wall-opening protective (moldable wall opening protective)

Related Sections:

3. Section 026000 Electrical

### 1.3 ACTION SUBMITTALS

Product Data: For each type of product indicated.

Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.

Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

### 1.4 INFORMATIONAL SUBMITTALS

Qualification Data: For qualified Installer.

A. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

## 1.5 QUALITY ASSURANCE

Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

A. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.

1. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:

Penetration firestopping products bear classification marking of qualified testing and inspecting agency.

a. Classification markings on penetration firestopping correspond to designations listed by the following:

Intertek ETL SEMKO in its "Directory of Listed Building Products."

Preinstallation Conference: Conduct conference at Project site.

## 1.6 PROJECT CONDITIONS

Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

A. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

## 1.7 COORDINATION

Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

A. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

B. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Hilti, Inc.
1. Specified Technologies Inc.
2. 3M Fire Protection Products.
3. Tremco, Inc.; Tremco Fire Protection Systems Group.

### 2.2 PENETRATION FIRESTOPPING

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.

A. 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.

Fire-resistance-rated walls include fire-barrier walls .

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.

Horizontal assemblies include floors.

VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

Sealants: 250 g/L.
1. Sealant Primers for Nonporous Substrates: 250 g/L.
2. Sealant Primers for Porous Substrates: 775 g/L.

Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

Permanent forming/damming/backing materials, including the following:

Slag-wool-fiber or rock-wool-fiber insulation.

a. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
b. Fire-rated form board.
c. Moldable Putty: Basis of design is 3M Fire Barrier Moldable Putty Pads MPP+ or other approved product meeting the following criteria: One component, ready-to-use, intumescent elastomer capable of expanding a minimum of 3 times at 1000 degrees. The material shall be thixotropic and shall be applicable to overhead, vertical and horizontal firestops. Under normal conditions shall be noncorrosive to metal and compatible with synthetic cable jackets. The putty shall be listed by independent test agencies such as UL, Intertek or FM, tested to and pass the criteria of ASTM E814 (UL1479) Standard Test Method for Fire Tests of Penetration Firestop Systems. Materials shall meet the requirements of the IBC, NFPA 5000, NEC (MFPA 70) Building Codes.

Temporary forming materials.

3. Substrate primers.
4. Collars.
5. Steel sleeves.

## 2.3 MIXING

For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

A. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.

1. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
2. Remove laitance and form-release agents from concrete.

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.

B. 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

General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

A. 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.

After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

Install fill materials for firestopping by proven techniques to produce the following results:

Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

1. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

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 FIELD QUALITY CONTROL

Owner will engage a qualified testing agency to perform tests and inspections.

A. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.

B. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

## 3.5 CLEANING AND PROTECTION

Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.

A. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413

# SECTION 079200 – JOINT SEALANTS

## PART 1 - GENERAL

### 1.1 SUMMARY

This Section includes joint sealants for the following applications, including those specified by reference to this Section:

Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Exterior joints in horizontal traffic surfaces.
2. Interior joints in vertical surfaces and horizontal nontraffic surfaces.
3. Interior joints in horizontal traffic surfaces.

Related Sections include the following:

Division 08 Section "Glazing" for glazing sealants.

### 1.2 PERFORMANCE REQUIREMENTS

Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

### 1.3 SUBMITTALS

Product Data: For each joint-sealant product indicated.

Samples: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

Compatibility and adhesion test reports.

Product certificates. For each kind of joint sealant and accessory, from manufacturer.

For sealants indicated to be non-staining, manufacturer shall certify that sealant was tested on substrates according to ASTM C 1248 and found to be non-staining.

1.4 QUALITY ASSURANCE

Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:

Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

1.5 WARRANTY

Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

Warranty Period: Two years from date of Substantial Completion.

Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

Warranty Period: 10 years from date of Substantial Completion for exterior elastomeric sealants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 Articles.

2.2 MATERIALS, GENERAL

Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range of available colors including premium colors.

## 2.3 ELASTOMERIC JOINT SEALANTS

Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

Single Component Nonsag Neutral-Curing Silicone Sealant ES-1:

Products:

Dow Corning Corporation; 756.
a. Pecora Corporation; 890.
b. Sikasil WS-290
c. Type and Grade: S (single component) and NS (nonsag).
d. Class: 100.
e. Use Related to Exposure: NT (nontraffic).
f. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
g. Non-staining for natural stone substrates.
h. Field-tintable to match adjacent substrates.

Single-Component Neutral-Curing Silicone Sealant ES-2:

Products:

Dow Corning Corporation; 790.
i. Pecora Corporation; 864.
j. Tremco; Spectrem 2.
k. Sikasil WS-290

Type and Grade: S (single component) and NS (nonsag).
2. Class: 50.
3. Use Related to Exposure: NT (nontraffic).

4. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

Single-Component Traffic Exposure Neutral-Curing Silicone Sealant ES-3:

Products:

Dow Corning Corporation; 890-SL.
a. Dow Corning Corporation; 890 (Gun grade).
b. Dow Corning Corporation; 890-SL.
c. Pecora Corporation; 300 Pavement Sealant (Self Leveling).
d. Pecora Corporation; 301 Pavement Sealant (Gun grade).
e. Sikaflex

Type and Grade: S (single component) and P (pourable).
5. Class: 100/50.
6. Uses Related to Exposure: NT and T (traffic).
7. Uses Related to Joint Substrates: M A and O, as applicable to joint substrates indicated.

Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant ES-4:

Products:

Dow Corning Corporation; 786.
a. Pecora Corporation; 898.
b. Tremco; Tremsil 600 White.

Type and Grade: S (single component) and NS (nonsag).
8. Class: 25.
9. Use Related to Exposure: NT (nontraffic).
10. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

Single-Component Nonsag Urethane Sealant ES-5:

Products:

Pecora Corporation; Dynatrol I-XL.
a. Sika Corporation, Inc.; Sikaflex 15LMg
b. Tremco; DyMonic.
c. Tremco; Vulkem 921.

Type and Grade: S (single component) and NS (nonsag).
11. Class: 25.
12. Use Related to Exposure: NT (nontraffic).
13. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

14. Paintable.

## 2.5 LATEX JOINT SEALANTS

Latex Sealant LS-1: Comply with ASTM C 834, Type P, Grade NF.

Products:

Pecora Corporation; AC-20+.
1. Sonneborn, Division of ChemRex Inc.; Sonolac.
2. Tremco; Tremflex 834.

## 2.6 ACOUSTICAL JOINT SEALANTS

Acoustical Sealant for Exposed and Concealed Joints AS-1: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

Products:

Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
a. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

Acoustical Sealant for Concealed Joints AS-2: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

Products:

Pecora Corporation; BA-98.
b. Tremco; Tremco Acoustical Sealant.

## 2.7 JOINT-SEALANT BACKING

General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), or B (bicellular material with a surface skin), as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. For curtain wall applications, Type O (open-cell material) may be considered; consult the sealant manufacturer to confirm the specific backer material to be used for the specific project and application, and submit to Architect the manufacturer's written recommendations.

Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.8 MISCELLANEOUS MATERIALS

Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

# PART 3 - EXECUTION

## 3.1 PREPARATION

Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.

Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.

Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

Remove laitance and form-release agents from concrete.

Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

## 3.2 INSTALLATION

Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

Install sealant backings of type recommended by manufacturer to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

Do not leave gaps between ends of sealant backings.

1. Do not stretch, twist, puncture, or tear sealant backings.
2. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

Install sealants using proven techniques that comply with the following and at the same time backings are installed:

Place sealants so they directly contact and fully wet joint substrates.

3. Completely fill recesses in each joint configuration.
4. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

Remove excess sealant from surfaces adjacent to joints.

5. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
6. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

Installation of Preformed Silicone-Sealant System: Comply with manufacturer's written instructions.

Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

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.

## 3.3 EXTERIOR JOINT-SEALANT SCHEDULE

Precast concrete, vertical construction joints:

ES-1 Single-component non-sag neutral-curing silicone sealant.

Cast-in-place concrete, vertical construction joints:

ES-2 Single-component neutral-curing silicone sealant.

Cast-in-place concrete slabs, horizontal nontraffic and traffic isolation and contraction joints:

ES-3 Single-component pourable neutral-curing silicone sealant.

Unit masonry, vertical control and expansion joints:

ES-2 Single-component neutral-curing silicone sealant.

Metal panels, butt joints:

ES-2 Single-component neutral-curing silicone sealant.

Portland cement plaster, exterior vertical joints:

ES-2 Single-component neutral-curing silicone sealant.

Exterior vertical joints between different materials listed above:

ES-2 Single-component neutral-curing silicone sealant.

Exterior perimeter joints between materials listed above and frames of doors windows and louvers.

ES-2 Single-component neutral-curing silicone sealant.

Exterior control and expansion joints in ceilings and other overhead surfaces.

ES-2 Single-component neutral-curing silicone sealant.

Exterior control and expansion joints in horizontal traffic surfaces of unit pavers:

ES-3 Single-component pourable neutral-curing silicone sealant.

Other vertical or horizontal non-traffic joints:

ES-2 Single-component neutral-curing silicone sealant.

Other exterior horizontal traffic joints:

ES-3 Single-component pourable neutral-curing silicone sealant.

## 3.4 INTERIOR JOINT SEALANT SCHEDULE

Vertical control and expansion joints on exposed interior surfaces of exterior walls.

ES-2 Single-component neutral-curing silicone sealant.

Interior perimeter joints of exterior openings.

ES-2 Single-component neutral-curing silicone sealant.

Interior tile expansion, control, contraction, and isolation joints in vertical surfaces.

ES-5 Single-component single component non-sag urethane sealant.

Interior ceramic tile expansion, control, contraction, and isolation joints in horizontal traffic surfaces.

ES-3 Single-component pourable neutral-curing silicone sealant.

Interior joints between plumbing fixtures and adjoining walls, floors, and counters.

ES-4 Single-component mildew-resistant neutral -curing silicone sealant.

Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.

LS-1 Latex sealant.
1. Joint-Sealant Color: Paintable white.

Other non-dynamic interior joints including between interior wall surfaces and casework.

LS-1 Latex sealant.
2. Joint-Sealant Color: Clear.

Acoustical interior joints for exposed joints.

AS-1 Latex sealant.

Acoustical interior joints for concealed joints.

AS-2 Latex sealant.

END OF SECTION 079200

# SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes hollow-metal work.

A. Related Requirements:

Section 09 22 16 “NON-STRUCTURAL METAL FRAMING” and 09 29 00 “GYPSUM BOARD.”

### 1.3 DEFINITIONS

Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

### 1.4 COORDINATION

Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

### 1.5 ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.

Shop Drawings: Include the following:

Elevations of each door type (METAL DOORS ARE NOT PART OF THIS PROJECT).

1. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
2. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
3. Locations of reinforcement and preparations for hardware.
4. Details of each different wall opening condition.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

Green Globes Submittals:

Product Data: For adhesives and composite wood products, documentation indicating that product contains no urea formaldehyde.

Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

## 1.6 INFORMATIONAL SUBMITTALS

Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

## 1.7 DELIVERY, STORAGE, AND HANDLING

Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

Provide additional protection to prevent damage to factory-finished units.

Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

A. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide door frame products by one of the following:

Amweld International, LLC.
1. Ceco Door.
2. Deansteel Manufacturing Company, Inc..
3. Mesker Door Inc.
4. Pioneer Industries, Inc.
5. Republic Doors and Frames.

Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

## 2.2 REGULATORY REQUIREMENTS

Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings[ and temperature-rise limits] indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

## 2.3 INTERIOR DOORS AND FRAMES

Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 3.

Physical Performance: Level According to SDI A250.4.
1. Frames:

Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
a. Construction: Full profile welded.

Exposed Finish: Prime.

Frames:

Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum A40 coating.
b. Construction: Full profile welded.

Exposed Finish: Prime.

## 2.4 FRAME ANCHORS

Jamb Anchors:

Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:

Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

## 2.5 MATERIALS

Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

A. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

B. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

## 2.6 FABRICATION

Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
3. Jamb Anchors: Provide number and spacing of anchors as follows:

Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

Three anchors per jamb up to 60 inches high.
1) Four anchors per jamb from 60 to 90 inches high.
2) Five anchors per jamb from 90 to 96 inches high.
3) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

Head Anchors: Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
4. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
a. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

B. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
1. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

## 2.7 STEEL FINISHES

Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

A. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

A. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

## 3.3 INSTALLATION

General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

A. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

At fire-rated openings, install frames according to NFPA 80.

a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
b. Install frames with removable stops located on secure side of opening.
c. Remove temporary braces necessary for installation only after frames have been properly set and secured.
d. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

e. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

2. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
3. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

a. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
b. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
c. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

Fire-Rated Doors: Install doors with clearances according to NFPA 80.

## 3.4 ADJUSTING AND CLEANING

Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

A. Remove grout and other bonding material from hollow-metal work immediately after installation.

B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

C. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

# SECTION 081416 - FLUSH WOOD DOORS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces (ALL NEW DOORS SHALL MATCH EXISTING WITH SPECIES, FINISH AND MATCH).

Factory finishing flush wood doors.
Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Requirements:

1. Section 088000 "Glazing" for glass view panels in flush wood doors.

### 1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction, louvers, and trim for openings. Include factory-finishing specifications.

Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.

Dimensions and locations of mortises and holes for hardware.
Dimensions and locations of cutouts.
Undercuts.
Requirements for veneer matching.
Doors to be factory finished and finish requirements.
Fire-protection ratings for fire-rated doors.

B. Samples for Initial Selection: For factory-finished doors.

Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish.

Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.

a. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.

## 1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.

Mark each door ontop and bottom rail with opening number used on Shop Drawings.

## 1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

## 1.8 WARRANTY

A. A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inchin a 42-by-84-inchsection.

Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Algoma Hardwoods, Inc.
Eggers Industries.
Graham Wood Doors.
Marshfield Door Systems, Inc.
Oshkosh Door Company.
VT Industries, Inc.

B. Source Limitations: Obtain flush wood doors and wood paneling from single manufacturer.

Existing Doors: New doors shall match existing doors in wood veneer species, grain, cuts and rating (as indicated). Prefinished stain to match existing.
1. Door tag from existing door:




2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

1. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.

B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.

1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
Pairs: Provide formed-steel edges and astragals with intumescent seals.

a. Finish steel edges and astragals with baked enamelsame color as doors.

C. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1. Grade LD-2.
Blocking: Provide wood blocking in particleboard-core doors asfollows:

a. 5-inchtop-rail blocking, in doors indicated to have closers.
5-inchbottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
5-inchmidrail blocking, in doors indicated to have exit devices.

D. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as follows:

a. 5-inchtop-rail blocking.
5-inchbottom-rail blocking, in doors indicated to have protection plates.
5-inchmidrail blocking, in doors indicated to have armor plates.
5-inchmidrail blocking, in doors indicated to have exit devices.

2. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

a. Screw-Holding Capability: 475 lbf per WDMA T.M.-10.

## 2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors :

1. Grade: Premium, with Grade A faces .
Species: Match existing
Cut: Match existing.
Match between Veneer Leaves: Match existing.
Assembly of Veneer Leaves on Door Faces: Match existing.

Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet or more.
Exposed Vertical[and Top] Edges: Same species as faces or a compatible species - edge Type A.
Core: Particleboard Structural composite lumber.

## 2.4 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

1. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

C. Openings: Factory cut and trim openings through doors.

1. Light Openings: Trim openings with moldings of material and profile indicated.
Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."
Louvers: Factory install louvers in prepared openings.

## 2.5 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted ontop and bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

Transparent Finish (Match Existing):

1. Grade: Premium.
Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 5, conversion varnish.
Staining: As selected by Architect from manufacturer's full range.
Effect: Open-grain finish.
Sheen: Semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.

Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.

B. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

# SECTION 083113 - ACCESS DOORS AND FRAMES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes access doors and frames for walls and ceilings.

A. Related Requirements:

Section 233300 "Air Duct Accessories" for heating and air-conditioning duct access doors.

### 1.3 ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details material descriptions, dimensions of individual components and profiles, and finishes.

Product Schedule: For access doors and frames. Use same designations indicated on Drawings.

## PART 2 - PRODUCTS

### 2.1 ACCESS DOORS AND FRAMES

Flush Access Doors with Concealed Flanges :

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Acudor Products, Inc.

a. Babcock-Davis.
b. JL Industries, Inc.; a division of the Activar Construction Products Group.
c. Larsens Manufacturing Company.
d. Maxam Metal Products Limited.

e. Milcor; Commercial Products Group of Hart & Cooley, Inc.
f. Nystrom, Inc.
g. Williams Bros. Corporation of America (The).
h. Basis of design as indicated on the drawings.

Description: Face of door flush with frame; with concealed flange for gypsum board installation and concealed hinge.
2. Locations: Wall and ceiling.
3. Door Size: As indicated on drawings.
4. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch, 16 gage factory primed.
5. Frame Material: Same material and thickness as door.
6. Latch and Lock: Cam latch, screwdriver operated.

## 2.2 MATERIALS

Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60or A60metallic coating.

## 2.3 FABRICATION

General: Provide access door and frame assemblies manufactured as integral units ready for installation.

A. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

B. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.

## 2.4 FINISHES

Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

A. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

Comply with manufacturer's written instructions for installing access doors and frames.

### 3.3 ADJUSTING

Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 083113

# SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

1. Exterior storefront framing.

Storefront framing for punched openings.
Exterior manual-swing entrance doors and door-frame units.

### 1.3 PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at Project site.

### 1.4 ACTION SUBMITTALS

Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

2. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.

Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:

a. Joinery, including concealed welds.

Anchorage.
Expansion provisions.
Glazing.
Flashing and drainage.

3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inchlengths of full-size components and showing details of the following:

4. Joinery, including concealed welds.
Anchorage.
Expansion provisions.
Glazing.
Flashing and drainage.
Sill pan/sill subframe/sill receptor.

Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

## 1.5 INFORMATIONAL SUBMITTALS

Qualification Data: For Installer and laboratory mockup testing agency.

Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.

1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.

Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by manufacturer and witnessed by a qualified testing agency submit certified test reports showing compliance with specified performance characteristics and physical properties.

## 1.6 CLOSEOUT SUBMITTALS

Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

## 1.7 QUALITY ASSURANCE

Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer to perform work of this section.

Manufactures Qualifications: Manufacturers capable of providing field service representation during construction process.

Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

## 1.8 MOCKUPS

Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical wall area as shown on Drawings.

Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.9 WARRANTY

Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.

Noise or vibration created by wind and thermal and structural movements.

Deterioration of metals, metal finishes, and other materials beyond normal weathering.

Water penetration through fixed glazing and framing areas.

Failure of operating components.

2. Warranty Period: Five years from date of Substantial Completion.

Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

3. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
Cracking, checking, peeling, or failure of paint to adhere to bare metal.

4. Warranty Period: 20 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design aluminum-framed entrances and storefronts.

General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
Failure also includes the following:

a. Thermal stresses transferring to building structure.
Glass breakage.
Noise or vibration created by wind and thermal and structural movements.
Loosening or weakening of fasteners, attachments, and other components.
Failure of operating units.

Structural Loads:

2. Wind Loads: Standard.

Deflection of Framing Members: At design wind pressure, as follows:

3. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.

Deflection Parallel to Glazing Plane: Limited to [1/360 of clear span or 1/8 inch, whichever is smaller] [amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch].

Cantilever Deflection: Where framing members overhang an anchor point, as follows:

a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch or spans greater than 11 feet 8-1/4 inchesor 1/175 times span, for spans less than 11 feet 8-1/4 inches.

Structural: Test according to ASTM E 330 as follows:

4. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.

When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.

Test Durations: As required by design wind velocity, but not less than 10 seconds.

Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

5. Fixed Framing and Glass Area:

a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft..

6. Entrance Doors:

a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..

Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..

Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

7. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

Water Penetration under Dynamic Pressure: Test according to AAMA 501.1 as follows:

8. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

Maximum Water Leakage: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.

Interstory Drift: Accommodate design displacement of adjacent stories indicated.

9. Design Displacement: As indicated on Drawings.

Test Performance: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.4 at design displacement and 1.5 times the design displacement.

Energy Performance: Certify and label energy performance according to NFRC as follows:

10. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F 0.60 Btu/sq. ft. x h x deg F as determined according to NFRC 100.

Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.25 as determined according to NFRC 200.

Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 35 as determined according to NFRC 500.

Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

11. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.

a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.

Low Exterior Ambient-Air Temperature: 0 deg F.

Interior Ambient-Air Temperature: 75 deg F.

## 2.2 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products, noted as 'SF" on the drawings, by one of the following:

Basis-of-Design Product: Subject to compliance with requirements, storefront framing and entrances shall match existing or comparable product by one of the following:

1. Old Castle.
2. Kawneer North America.

United States Aluminum.

YKK AP America.

Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing spandrel panels and accessories, from single manufacturer.

## 2.3 FRAMING

Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Thermally broken.

Glazing System: Retained mechanically with gaskets on two sides and structural sealant on two sides.
Finish: Match existing.
Fabrication Method: Field-fabricated stick system.

Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

Sill Pan: Extruded aluminum, factory fabricated to provide sealed end dams, finished to match storefront; designed to direct water away from building when installed horizontally at sill. If manufacturer offers a similar sill pan as part of aluminum-framed entrance and storefront system, submit details and product data including finishes, for consideration and approved by Architect, PVC is not acceptable.

Materials:

2. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

a. Sheet and Plate: ASTM B 209.
Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
Structural Profiles: ASTM B 308/B 308M.

## 2.4 ENTRANCE DOOR SYSTEMS

Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.

1. Door Construction: 2-inchoverall thickness, with minimum 0.188-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

Door Design: As indicated.

## 2.5 ENTRANCE DOOR HARDWARE

General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule and entrance door hardware sets indicated in "Entrance Door Hardware Sets" Article for each entrance door to comply with requirements in this Section.

1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products to match existing.

Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

Opening-Force Requirements:

a. Egress Doors: Not more than 15 lbfto release the latch and not more than 30 lbfto set the door in motion[ and not more than 15 lbfto open the door to its minimum required width].

Accessible Interior Doors: Not more than 5 lbfto fully open door.

Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

Silencers: BHMA A156.16, Grade 1.

Finger Guards: Manufacturer's standard collapsible neoprene or PVC gasket anchored to frame hinge-jamb at center-pivoted doors.

## 2.6 GLAZING

Glazing: Comply with Section 088000 "Glazing."

Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

## 2.7 ACCESSORIES

Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.

Reinforce members as required to receive fastener threads..

Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

2. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-milthickness per coat.

## 2.8 FABRICATION

Form or extrude aluminum shapes before finishing.

Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.

Accurately fitted joints with ends coped or mitered.

Physical and thermal isolation of glazing from framing members.

Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

Provisions for field replacement of glazing from [exterior] [interior] [interior for vision glass and exterior for spandrel glazing or metal panels].

Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

Storefront Framing: Fabricate components for assembly using head-and-sill-receptor system with shear blocks at intermediate horizontal members.

Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

2. At exterior doors, provide compression weather stripping at fixed stops.

At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.

Entrance Doors: Reinforce doors as required for installing entrance door hardware.

At exterior doors, provide weather sweeps applied to door bottoms.

Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## 2.9 ALUMINUM FINISHES

Match Existing: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

General:

1. Comply with manufacturer's written instructions.

Do not install damaged components.
Fit joints to produce hairline joints free of burrs and distortion.
Rigidly secure nonmovement joints.
Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
Seal perimeter and other joints watertight unless otherwise indicated.

Metal Protection:

2. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.

Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

Install components plumb and true in alignment with established lines and grades.

Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

Install glazing as specified in Section 088000 "Glazing."

Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

3. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.

Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

## 3.3 ERECTION TOLERANCES

Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.

Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.

Alignment:

a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inchwide, limit offset from true alignment to 1/16 inch.

Where surfaces are separated by reveal or protruding element from 1/2 to 1 inchwide, limit offset from true alignment to 1/8 inch.

Where surfaces are separated by reveal or protruding element of 1 inchwide or more, limit offset from true alignment to 1/4 inch.

2. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inchover total length.

## 3.4 FIELD QUALITY CONTROL

Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.

Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.

a. Perform a minimum of three tests in areas as directed by Architect.

## 3.5 MAINTENANCE SERVICE

Entrance Door Hardware:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

Initial Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of entrance door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity. Use parts and supplies that are the same as those used in the manufacture and installation of original equipment.

END OF SECTION 084113

SECTION 08 71 00 - DOOR HARDWARE

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.

B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:

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

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

B. Related Sections:

1. Section 08 11 13 "Hollow Metal Doors and Frames" for astragals provided as part of labeled fire-rated assemblies and for door silencers provided as part of hollow-metal frames.
2. Section 08 14 16 "Flush Wood Doors" for astragals provided as part of labeled firerated assemblies.
3. Section 08 31 13 "Access Doors and Frames" for access door hardware .
4. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts" for installation of entrance door hardware, including cylinders.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes. B. Shop Drawings: Details of electrified door hardware, indicating the following:

1. Wiring Diagrams: For power, signal, and control wiring and including the following:

a. Details of interface of electrified door hardware and building safety and security systems.
b. Schematic diagram of systems that interface with electrified door hardware.
c. Point-to-point wiring.
d. Risers.
e. Elevations doors controlled by electrified door hardware.

2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

C. Samples for Verification: For exposed door hardware of each type required, in each finish specified, prepared on Samples of size indicated below. Tag Samples with full description for coordination with the door hardware schedule. Submit Samples before, or concurrent with, submission of door hardware schedule.

1. Sample Size: Full-size units or minimum 2-by-4-inch Samples for sheet and 4-inch long Samples for other products.
   a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements. D. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

   a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
   b. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
   c. Content: Include the following information:
      1) Identification number, location, hand, fire rating, size, and material of each door and frame.
      2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
      3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.

4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.

5) Fastenings and other pertinent information.

6) Explanation of abbreviations, symbols, and codes contained in schedule.

7) Mounting locations for door hardware.

8) List of related door devices specified in other Sections for each door and frame.

## 1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Architectural Hardware Consultant.

B. Product Certificates: For electrified door hardware, from the manufacturer.

1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

C. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes. D. Warranty: Special warranty specified in this Section.

## 1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware schedule.

## 1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

## 1.7 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:

1. For door hardware, an Architectural Hardware Consultant (AHC) who is also an Electrified Hardware Consultant (EHC) .

C. Source Limitations: Obtain each type of door hardware from a single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.

E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

F. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

G. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

H. Accessibility Requirements: For door hardware on doors in an accessible route, comply with [the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines] [ICC/ANSI A117.1] [HUD's "Fair Housing Accessibility Guidelines"] [and] <Insert regulation>.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.

b. Sliding Doors: 5 lbf applied parallel to door at latch.

c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high .

4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

I. Preinstallation Conference: Conduct conference at Project site .

1. Inspect and discuss electrical roughing-in for electrified door hardware.

2. Review sequence of operation for each type of electrified door hardware.

## 1.8 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

## 1.9 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems. Electrified hardware shall have Quick Connect hardware all the way to the power supply: no wire nut type or crimped connections shall be allowed.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

## 1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Structural failures including excessive deflection, cracking, or breakage.
   b. Faulty operation of doors and door hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Ten years from date of Substantial Completion, unless otherwise indicated.
   a. Electromagnetic and Delayed-Egress Locks: Two years from date of Substantial Completion.
   b. Exit Devices: Five years from date of Substantial Completion.
   c. Manual Closers: 10 years from date of Substantial Completion.
   d. Concealed Floor Closers: 10 years from date of Substantial Completion.

# PART 2 - PRODUCTS

## 2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled on Drawings to comply with requirements in this Section.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products, unless otherwise noted.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

   3. Manufacturers:
      1 Basis of Design: Corbin Russwin
      2 Sargent
      3 Schlage

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 2 Articles following. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements.

## 2.2 HINGES

A. Hinges: BHMA A156.1 and A156.7. Provide template-produced hinges for swinging doors where scheduled. 1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.

2. Provide five-knuckle full mortise butt hinges unless otherwise indicated ball-bearing hinges at all doors having closers.
3. Provide non-removable pins on exterior outswinging doors.
4. Provide non-removable pins on outswinging interior doors at access controlled doors.
5. Provide 5 inch heavy weight hinges for doors 36 inches and over in width.
6. Manufacturers: Subject to compliance with requirements, provide products by one of the following :

    a. Corbin Russwin (Basis of Design)
    b. Sargent
    c. Schlage
    d. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.3 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in Part 4 - Hardware Sets.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Mortise Locks: Minimum 3/4-inch latchbolt throw.
2. Deadbolts: Minimum 1.25-inch bolt throw.

C. Lock Backset: 2-3/4 inches, unless otherwise indicated.

D. Lock Trim:

1. Levers: Cast.

    a. P Lever Design.

2. Escutcheons (Roses): Wrought .

3. Dummy Trim: Match lever lock trim and escutcheons.
4. Operating Device: Lever with escutcheons (roses).

E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
3. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.

F. Mortise Locks: BHMA A156.13; Security Grade 1 ; stamped steel case with steel or brass parts; Series 1000.
1. Corbin Russwin (Basis of Design)
2. Sargent
3. Schlage
4. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.4 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.
1. SARGENT Manufacturing Company; an ASSA ABLOY Group company, 80 series.
2. Von Duprin, a brand of Allegion, series 99 or 33
3. Stanley Security Solutions Precision Hardware series

## 2.5 LOCK CYLINDERS

A. Lock Cylinders for renovation projects: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, to accept Best Access Systems 7-pin IC cores -American type only.

1. Manufacturer: Same manufacturer as for locking devices.

B. Lock Cylinders for new construction: (New Specification as of July 2016) proprietary high security cylinder. Contact SCC Access Control Shop for assistance

C. Standard Lock Cylinders: BHMA A156.5; Grade 1; permanent cores that are removable; face finished to match lockset.

D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

## 2.6 KEYING

A. SCC with the end user shall develop a key schematic. Keys and combinated cores shall be provided and installed by Stanley Convergent Security Solutions / Best Access control thru the project. Keying shall be complete and keys turned over to Owner prior to Substantial Completion.

## 2.7 OPERATING TRIM

A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.
   1. Provide push and pull on doors not specified to have lockset, latchset, exit device, or auxiliary lock.
   2. On solid doors, provide matching push plate and pull plate on opposite faces. Basis-ofDesign Product: Subject to compliance with requirements, provide Ives Hardware 8103EZ pull and 8300 push plate, or comparable product by one of the following:

      a. Rockwood Manufacturing Company, 111 pull and 70C push plate.
      b. Trimco.
      c. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.8 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release; and with internal override.

   1. Basis-of-Design Product: Subject to compliance with requirements, provide Ives Hardware COR Series with FL filler bar, or comparable product by one of the following:

      a. Trimco, 3094 Series.
      b. Rockwood Manufacturing Company, 1600 Series with filler bar.

B. Astragals: BHMA A156.22.

## 2.9 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
   1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
   2. Provide a door closer on every exterior door.

3. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
4. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
5. At corridors, locate door-mounted closer on room side of door.
6. At outswinging exterior doors, mount closer in inside of door.
7. SARGENT Manufacturing Company; an ASSA ABLOY Group company, 351 series.

## 2.19 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Basis-of-Design Product: Subject to compliance with requirements, provide National Guard Products 127NA seals and 199NA sweeps, or comparable product by one of the following:

    a. Pemko Manufacturing Co.; an ASSA ABLOY Group company, 375_R seals and 368_N sweeps.
    b. Reese Enterprises, Inc., DS70C seals and 323A sweeps.
    c. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.11 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening and full depth of frame.

1. Basis-of-Design Product: Subject to compliance with requirements, provide National Guard Products Flat Saddle, 1/4" height, thresholds, or comparable product by one of the following:

    a. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    b. Reese Enterprises, Inc.

## 2.12 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Plate Units: BHMA A156.6; fabricated from minimum 0.060-inch- thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Trimco KX064 series plates, or comparable product by one of the following:

    a. Burns Manufacturing Incorporated, K1062 series.

b. Rockwood Manufacturing Company, XP62 series.

c. Substitutions: See Section 01 25 00 - Substitution Procedures.

B. Metal Protective Trim Door Edge Units: BHMA A156.6; fabricated from minimum 0.050-inch-thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Trimco KE33-1 edge guards, or comparable product by one of the following:

a. Burns Manufacturing Incorporated, Model 303.

b. Rockwood Manufacturing Company, model 306.

c. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.13 FABRICATION

A. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

B. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2. Fire-Rated Applications:

a. Wood or Machine Screws: For the following:

1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors.

2) Strike plates to frames.

3) Closers to doors and frames.

b. Steel Through Bolts: For the following unless door blocking is provided:

1) Closers to doors and frames.

2) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.14 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
1. Standard Steel Doors and Frames: ANSI/SDI A250.8.

2. Custom Steel Doors and Frames: HMMA 831.

3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
1. Furnish permanent cores to Owner for installation.

E. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings . Verify location with Architect.

1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

F. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 92 00 "Joint Sealants."

G. Stops: Provide floor stops for doors unless overhead stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

H. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

I. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

J. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

## 3.3 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

## 3.4 ADJUSTING

Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating andventilating equipment and to comply with referenced accessibility requirements. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

A. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

## 3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.
B. Clean operating items as necessary to restore proper function and finish.
C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

## 3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Section 01 79 00 "Demonstration and Training."

## 3.7 Hardware Schedule

**HW SET # 1** DOORS: G31B, G33A, G33B, G17, G54B

| | | | | | |
|---|---|---|---|---|---|
| 3 | Hinge | TA2714 | US26D | MK | 087100 |
| 1 | Storeroom Lock | LC 8204 LNJ | US32D | SA | 087100 |
| 1 | Schlage Cylinder | AS REQUIRED | 626 | SC | 087100 |
| 1 | Door Closer | 351 O | EN | SA | 087100 |
| 2 | Kick Plate | K1050 8" CSK 3BE | US32D | RO | 087100 |
| 1 | Door Stop | 406/441CU | 32D/26D | RO | 087100 |
| 1 | Set Door Seals/Silencers | S88D/608 AS REQUIRED | | PE | 087100 |

**HW SET # 2** DOORS: G71B, G35A, G35B, G57, G54A, G55, G56, G57, G58A, G59

| | | | | | |
|---|---|---|---|---|---|
| 3 | Hinge | TA2714 | US26D | MK | 087100 |
| 1 | Passage Set | 8215 LNJ | US32D | SA | 087100 |
| 1 | Door Stop | 406/441CU | 32D/26D | RO | 087100 |
| 1 | Door Seals | BY FRAME MANUFACTURER | | 00 | 084113 |

**HW SET # 3** DOORS: G71A, G34, G46, G47, G17, 103, 104, 105

| | | | | | |
|---|---|---|---|---|---|
| 3 | Hinge | TA2714 | US26D | MK | 087100 |
| 1 | Office Lock | LC 8205 LNJ | US32D | SA | 087100 |
| 1 | Schlage Cylinder | AS REQUIRED | 626 | SC | 087100 |
| 1 | Door Stop | 406/441CU | 32D/26D | RO | 087100 |

**HW SET # 4** DOORS: G16

| | | | | | |
|---|---|---|---|---|---|
| 3 | Hinge | T4A3386 x NRP | US32D | MK | 087100 |
| 1 | Storeroom Lock | LC LX RX 8204 LNJ | US32D | SA | NOTE 1 |
| 1 | Medeco Cylinder | AS REQUIRED | 26 | MC | 087100 |
| 1 | Door Closer | 351 O | EN | SA | 087100 |

**HW SET # 5** DOORS: G3

| | | | | | |
|---|---|---|---|---|---|
| 3 | Hinge | TA2714 | US26D | MK | 087100 |
| 1 | Storeroom Lock | LC 8204 LNJ | US32D | SA | 087100 |
| 1 | Schlage Cylinder | AS REQUIRED | 626 | SC | 087100 |
| 1 | Door Closer | 351 O | EN | SA | 087100 |
| 1 | Door Stop | 406/441CU | 32D/26D | RO | 087100 |
| 1 | Set Door Seals/Silencers | S88D/608 AS REQUIRED | | PE | 087100 |

**HW SET # 6** DOORS: 102A

| | | | | | |
|---|---|---|---|---|---|
| 6 | Hinge | TA2714 | US26D | MK | 087100 |
| 1 | Set Auto Flush Bolts | 2842/2942 | US26D | RO | 087100 |
| 1 | Dust Proof Strike | 570 | US26D | RO | 087100 |
| 1 | Classroom Lock | LC 8237 LNJ | US32D | SA | 087100 |
| 1 | Schlage Cylinder | AS REQUIRED | 626 | SC | 087100 |
| 1 | Coordinator | 2600 x FILLER BAR | Black | RO | 087100 |
| 2 | Door Closer | 351 O | EN | SA | 087100 |
| 2 | Door Stop | 406/441CU | 32D/26D | RO | 087100 |
| 1 | Set Door Seals/Silencers | S88D/608 AS REQUIRED | | PE | 087100 |

**HW SET # 7** DOORS G30A, G41A, G31A, G35B

| | | | | | |
|---|---|---|---|---|---|
| 3 | Hinge | TA2714 | US26D | MK | 087100 |
| 1 | Elect Rim Fire Exit Device | LC 12 55 8875 ETJ | US32D | SA | NOTE 1 |
| 1 | Schlage Cylinder | AS REQUIRED | 626 | SC | 087100 |
| 1 | Door Closer | 351 O | EN | SA | 087100 |
| 1 | Door Stop | 406/441CU | 32D/26D | RO | 087100 |
| 1 | Set Door Seals | S88D | | PE | 087100 |
| 1 | ElectroLynx Harness | QC-C1500P x LAR (@ JAMB) | | MK | NOTE 1 |
| 1 | ElectroLynx Harness | QC-C000 x LAR | | MK | NOTE 1 |
| 1 | Electric Power Transfer | EL-CEPT | | SU | NOTE 1 |
| 1 | Power Supply | AS REQUIRED | | 00 | NOTE 1 |
| 1 | Door Posi on Switch | DPS-M/W | | SU | NOTE 1 |
| 1 | Horn | ES4300A | | 00 | NOTE 1 |
| 1 | Wiring Diagram | WD-SYSPK | | SA | NOTE 1 |

MANUFACTURERS ABBREVIATIONS:

1. MK - McKinney
2. PE - Pemko
3. RO – Rockwood
4. SA - Sargent
5. SC - Schlage
6. MC - Medeco
7. RF - Rixson
8. NO - Norton
9. SU – Securitron
10. CR – Corbin Russwin

**END OF SECTION 08 71 00**

# SECTION 088000 - GLAZING

## PART 1 - GENERAL

### 1.1 SUMMARY

Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

Doors.
1. Storefront framing.
2. Glazed entrances.
3. Interior borrowed lites.

Windows.
1. Hollow metal framing, Rated and Non-Rated.

### 1.2 PERFORMANCE REQUIREMENTS

Delegated Design: Design glass, including comprehensive engineering analysis according to ICC's 2023 International Building Code by a qualified professional engineer, using the following design criteria:

Design Wind Pressures: As indicated on Drawings.
1. Design Snow Loads: As indicated on Drawings.
2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

### 1.3 PRECONSTRUCTION TESTING

Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

### 1.4 ACTION SUBMITTALS

Product Data: For each glass product and glazing material indicated.

A. Green Globes Submittals:

Product Data: For glazing sealants used inside the weatherproofing system, documentation including printed statement of VOC content.

Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

C. Rated glazing: Refer to Glazing Legend on the drawings.

D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

## 1.5 INFORMATIONAL SUBMITTALS

Preconstruction adhesion and compatibility test report.

## 1.6 QUALITY ASSURANCE

Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

GANA Publications: GANA's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual."

1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

B. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1.7 WARRANTY

Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

Warranty Period: 10 years from date of Substantial Completion.

Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

A. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

B. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.

1. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
2. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

## 2.2 GLASS PRODUCTS

Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

A. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.

B. Frosted Glass:

## 2.3 INSULATING GLASS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Guardian SN68 (Basis of Design)
1. Cardinal
2. AGC
3. Old Castle.

Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.

Sealing System: Dual seal.
4. Spacer: Manufacturer's standard spacer material and construction.

## 2.4 GLAZING GASKETS

Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:

EPDM complying with ASTM C 864.
1. Silicone complying with ASTM C 1115.
2. Thermoplastic polyolefin rubber complying with ASTM C 1115.

Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

## 2.5 GLAZING SEALANTS

General:

Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

1. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
2. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

## 2.6 GLAZING TAPES

Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

1. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

## 2.7 MISCELLANEOUS GLAZING MATERIALS

Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

B. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

C. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

D. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

E. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

## 2.8 MONOLITHIC-GLASS TYPES

Glass Type: Clear annealed float glass.

Thickness: 6.0 mm.
1. Provide tempered glass where indicated or scheduled.

Glass Type: heat-strengthened float glass.

Thickness: 6.0 mm.
2. Provide safety glazing labeling.
3. Provide tempered glass where indicated or scheduled.

Glass Type: Frosted heat-strengthened float glass.

Thickness: 6.0 mm.
4. Provide safety glazing labeling.
5. Provide tempered glass where indicated or scheduled.

## 2.9 INSULATING-GLASS TYPES

Glass Type: Low-e-coated, clear insulating glass.

Basis of Design: Guardian SunGuard SN 54
1. Overall Unit Thickness: 1 inch.
2. Thickness of Each Glass Lite: 6.0 mm.
3. Outdoor Lite: Heat-strengthened float glass. Color : CLEAR
4. Interspace Content: Air.
5. Indoor Lite: Float glass. Color : CLEAR
6. Low-E Coating: Pyrolytic or sputtered on second or third surface.
7. Visible Light Transmittance: 54% percent minimum.
8. Winter Nighttime U-Factor: 0.29 maximum.
9. Summer Daytime U-Factor: 0.27 maximum.
10. Solar Heat Gain Coefficient: 0.28 maximum.
11. Provide tempered glass (both lites) where indicated or scheduled.
12. Provide safety glazing labeling.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

A. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

A. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

B. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

C. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

D. Apply heel bead of elastomeric sealant.

E. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

F. Apply cap bead of elastomeric sealant over exposed edge of tape.

## 3.3 GASKET GLAZING (DRY)

Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

A. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

B. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

C. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Install gaskets so they protrude past face of glazing stops.

## 3.4 SEALANT GLAZING (WET)

Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

A. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

B. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

## 3.5 CLEANING AND PROTECTION

Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

A. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

B. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

C. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION 088000

# SECTION 092216 - NON-STRUCTURAL METAL FRAMING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Non-load-bearing steel framing systems for interior partitions.

### 1.3 ACTION SUBMITTALS

Product Data: For each type of product.

Studs and Runners: Provide documentation that framing members' certification is according to SIFA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members."

### 1.4 INFORMATIONAL SUBMITTALS

Evaluation Reports: For embossed steel studs and runners firestop tracks, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

B. Horizontal Deflection: For wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 5 lbf/sq. ft..

## 2.2 FRAMING SYSTEMS

Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.

1. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.

Studs and Runners: ASTM C 645. Use either steel studs and runners or embossed steel studs and runners.

Steel Studs and Runners:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Phillips Manufacturing Co.
2) Steel Network, Inc. (The).
3) Telling Industries.

Minimum Base-Metal Thickness: 0.0296 inch.

a. Depth: As indicated on Drawings.
b. Minimum Base-Metal Thickness, at tile backer panels and supporting wall-hung cabinets: 0.0329 inch.

Embossed Steel Studs and Runners:

Manufacturers:Subject to compliance with requirements, provide products by one of the following:

1) ClarkDietrich Building Systems.
2) MarinoWARE.
3) Phillips Manufacturing Co.
4) Steel Network, Inc. (The).
5) Telling Industries.

Minimum Base-Metal Thickness: As required by horizontal deflection performance requirements.

c. Depth: As indicated on Drawings.

Slip-Type Head Joints: Where indicated, provide[ one of] the following:

Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to runners while allowing 2-inch minimum vertical movement.

Products:Subject to compliance with requirements, provide one of the following:

CEMCO; California Expanded Metal Products Co.; Deflex Clips.
1) ClarkDietrich Building Systems; FTC3 o rFTC5.
2) Fire Trak Corp; PosiKlip or RediKlip.
3) Steel Network, Inc. (The); VertiClip SLD Series.

Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

2. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

Products:Subject to compliance with requirements, provide one of the following:
1) CEMCO; California Expanded Metal Products Co.; CST Slotted Deflection Track or SLP-TRK Slotted Deflection Track.
2) ClarkDietrich Building Systems; SLP-TRK Slotted Deflection Track
3) MBA Building Supplies; FlatSteel Deflection Track or Slotted Deflecto Track.
4) Metal-Lite; The System.
5) Steel Network, Inc. (The); VertiClip SLD with 3" slot.
6) Telling Industries; Vertical Slip Track.

Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

Products:Subject to compliance with requirements, provide one of the following:

ClarkDietrichBlazeframe Fire Stop System.
a. CEMCO; California Expanded Metal Products Co.; FAS Track.
b. Fire Trak Corp; Fire Trak System attached to studs with Fire Trak Posi Klip.
c. Metal-Lite; The System.
d. Perfect Wall, Inc.; The System Slotted Deflection Track..
e. Steel Network, Inc. (The); VertiTrack VT.

Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

Manufacturers:Subject to compliance with requirements, provide products by one of the following:

MRI Steel Framing, LLC.

Minimum Base-Metal Thickness: 0.0269 inch.

Backing plates (Contractor's option): In lieu of flat steel straps, provide Dietrich Danback flexible wood backing plate system for attachment of cabinets, handrails, and wall fixtures in non-rated walls.

B. Beam and Column Clip: Galvanized steel.

C. Cold-Rolled Furring Channels: 0.053-inchuncoated-steel thickness, with minimum 1/2-inch-wide flanges.

Depth: 3/4 inch.

## 2.3 SUSPENSION SYSTEMS

Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

A. Hanger Attachments to Concrete:

Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.

1. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inchin diameter.

B. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inchand minimum 1/2-inch-wide flanges.

Depth: As indicated on Drawings.

Furring Channels (Furring Members):

Cold-Rolled Channels: 0.0538-inchuncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inchdeep.

1. Steel Studs and Runners: ASTM C 645.

Minimum Base-Metal Thickness: 0.0296 inch.

a. Depth: As indicated on Drawings.

Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

Products:Subject to compliance with requirements, provide one of the following:

Armstrong World Industries, Inc; Drywall Grid Systems.

b. Chicago Metallic Corporation; 640/660 Drywall Ceiling Suspension.

c. United State Gypsum Company; Drywall Suspension System.

## 2.4 AUXILIARY MATERIALS

General: Provide auxiliary materials that comply with referenced installation standards.

Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

Isolation Strip at Exterior Walls: Provide one of the following:

Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), nonperforated.

1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inchthick, in width to suit steel stud size.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

A. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

## 3.3 INSTALLATION, GENERAL

Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

Install framing and accessories plumb, square, and true to line, with connections securely fastened.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

## 3.4 INSTALLING FRAMED ASSEMBLIES

Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

Single-Layer Application: 16 incheso.c. unless otherwise indicated.

1. Multilayer Application: 16 incheso.c. unless otherwise indicated.
2. Tile Backing Panels: 16 incheso.c. unless otherwise indicated.

Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

1. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

Install two studs at each jamb unless otherwise indicated.

a. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inchclearance from jamb stud to allow for installation of control joint in finished assembly.
b. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

2. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

Z-Shaped Furring Members:

Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.

3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inchfrom the plane formed by faces of adjacent framing.

END OF SECTION 092216

# SECTION 092900 - GYPSUM BOARD

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Interior gypsum board.

1. Tile backing panels.

Related Requirements:

2. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

### 1.3 ACTION SUBMITTALS

Product Data: For each type of product.

### 1.4 DELIVERY, STORAGE AND HANDLING

Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

### 1.5 FIELD CONDITIONS

Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

A. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

B. Do not install panels that are wet, moisture damaged, and mold damaged.

Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

1. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

### 2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### 2.3 INTERIOR GYPSUM BOARD

Gypsum Wallboard: ASTM C 1396/C 1396M.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Basis-of-Design Product:Subject to compliance with requirements, provide Georgia-Pacific Building Products. or comparable product by one of the following:

American Gypsum.

a. CertainTeed Corporation.

c. National Gypsum Company.

d. USG.

Thickness: as noted on drawings.

2. Long Edges: Tapered.

Gypsum Board, Type X: ASTM C 1396/C 1396M.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

3. Basis-of-Design Product:Subject to compliance with requirements, provide Georgia-Pacific Building Products or comparable product by one of the following:

American Gypsum.

a. CertainTeed Corporation.
c. National Gypsum Company.
d. USG.

Thickness: 5/8 inch.
4. Long Edges: Tapered.

Gypsum Ceiling Board: ASTM C 1396/C 1396M.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:
5. Basis-of-Design Product:Subject to compliance with requirements, provide National Gypsum Company or comparable product by one of the following:

American Gypsum.
a. CertainTeed Corporation.
c. Georgia-Pacific Building Products.
d. USG.

Thickness: 1/2 inch.
6. Long Edges: Tapered.

Impact-Resistant Gypsum Board: ASTM C 1396/C 1396M gypsum board, tested according to ASTM C 1629/C 1629M.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:
7. Basis-of-Design Product:Subject to compliance with requirements, provide National Gypsum Company, Gold Bond Hi-Impact or comparable product by one of the following:

American Gypsum.
a. CertainTeed Corporation.
c. Georgia-Pacific Building Products.
d. USG.

Core: 5/8 inch, Type X.
8. Surface Abrasion: ASTM C 1629/C 1629M, meets or exceeds [Level 1] [Level 2] [Level 3] requirements.
9. Indentation: ASTM C 1629/C 1629M, meets or exceeds Level 3 requirements.
10. Soft-Body Impact: ASTM C 1629/C 1629M, meets or exceeds Level 3 requirements.
11. Hard-Body Impact: ASTM C 1629/C 1629M, meets or exceeds Level 3 requirements according to test in Annex A1.
12. Long Edges: Tapered.
13. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3273.

Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

14. Basis-of-Design Product:Subject to compliance with requirements, provide National Gypsum Company or comparable product by one of the following:

American Gypsum.
a. CertainTeed Corporation.
Georgia-Pacific Building Products.
USG.

Core: 5/8 inch, Type X.

15. Long Edges: Tapered.
16. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

## 2.4 TILE BACKING PANELS

Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Basis-of-Design Product:Subject to compliance with requirements, provide Georgia-Pacific Building Products or comparable product by one of the following:

CertainTeed Corporation.
National Gypsum Company.
Temple-Inland Building Products by Georgia-Pacific.

Core: As indicated on Drawings.

2. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

## 2.5 TRIM ACCESSORIES

Interior Trim: ASTM C 1047.

Material: Galvanized or aluminum-coated steel sheet or rolled zinc.

1. Shapes:

Cornerbead.
a. Bullnose bead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.

Expansion (control) joint.

## 2.6 JOINT TREATMENT MATERIALS

General: Comply with ASTM C 475/C 475M.

A. Joint Tape:

Interior Gypsum Board: Paper.

Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

1. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

Fill Coat: For second coat, use drying-type, all-purpose compound.

2. Finish Coat: For third coat, use drying-type, all-purposecompound.

Joint Compound for Tile Backing Panels:

Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

## 2.7 AUXILIARY MATERIALS

General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inchthick.

Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Basis-of-Design Product:Subject to compliance with requirements, provide United States Gypsum Company or comparable product by one of the following:

   Accumetric LLC.
   a. Grabber Construction Products.
   b. Hilti, Inc.
   c. Pecora Corporation.
   d. Specified Technologies, Inc.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLYING AND FINISHING PANELS, GENERAL

Comply with ASTM C 840.

A. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inchof open space between panels. Do not force into place.

C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

D. Form control and expansion joints with space between edges of adjoining gypsum panels.

E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

1. Fit gypsum panels around ducts, pipes, and conduits.
2. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

F. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

G. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

H. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

## 3.3 APPLYING TILE BACKING PANELS

Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4-inchgap where panels abut other construction or penetrations.

A. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

## 3.4 INSTALLING TRIM ACCESSORIES

General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

A. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

B. Interior Trim: Install in the following locations:

Cornerbead: Use at outside corners unless otherwise indicated.
1. Bullnose Bead: Use where indicated.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use [where indicated] <Insert requirements>.
4. U-Bead: Use where indicated.
5. 1/2" Reveal: Use where indicated.

## 3.5 FINISHING GYPSUM BOARD

General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

A. Prefill open joints, rounded or beveled edges, and damaged surface areas.

B. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

C. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

Level 1: Ceiling plenum areas, concealed areas, and where indicated.
1. Level 2: Panels that are substrate for tile.
2. Level 3: Where indicated on Drawings.
3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

Level 5: Where indicated on Drawings.

Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

## 3.6 PROTECTION

Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

1. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

# SECTION 093000 - TILING

## PART 1 - GENERAL

### 1.1 SUMMARY

Section Includes:

Porcelain tile.
1. Waterproof membrane.
2. Crack isolation membrane.
3. Tile backing panels.
4. Metal edge strips.

### 1.2 ACTION SUBMITTALS

Product Data: For each type of product indicated.

Samples:

Each type and composition of tile and for each color and finish required.
1. Assembled samples, with grouted joints, for each type and composition of tile and for each color and finish required.

### 1.3 MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering and identified with labels describing contents.

Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

### 1.4 QUALITY ASSURANCE

Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Build mockup of each type of floor tile installation.
1. Build mockup of each type of wall tile installation.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 TILE PRODUCTS

ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

A. FloorScore Compliance: Tile for floors shall comply with requirements of FloorScore Standard.

B. Tile: Refer to Finish Schedule on the Drawings.

Mounting: Factory, back mounted (for wall applications, see drawings for locations).

1. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

Base Cap: Schluter Stainless Steel edge protection as indicated on drawings.

a. External Corners: Schluter Stainless Steel edge protection as indicated on drawings.
b. Internal Corners: Schluter Stainless Steel edge protection as indicated on drawings.

2.2 TRANSITIONS AND TERMINATIONS

General: Provide stainless steel or extruded aluminum edge strip as indicated on drawings.

2.3 TILE BACKING PANELS

Cementitious Backer Units: ANSI A118.9 or ASTM C 1325.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

C-Cure; C-Cure Board 990.

a. Custom Building Products; Wonderboard.
b. USG Corporation; DUROCK Cement Board.

Thickness: 1/2 inch.

2.4 WATERPROOF MEMBRANE

General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated.

A. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

Bonsal American, an Oldcastle company; B 6000 Waterproof Membrane with Glass Fabric.
a. Bostik, Inc.; Hydroment Blacktop 90210.
b. Custom Building Products; 9240 Waterproofing and Anti-Fracture Membrane.
c. Laticrete International, Inc.; Laticrete 9235 Waterproof Membrane.
d. MAPEI Corporation; Mapelastic HPG with MAPEI Fiberglass Mesh.
e. Summitville Tiles, Inc.; S-9000.

Latex-Portland Cement: Flexible mortar consisting of cement-based mix and latex additive.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

C-Cure; UltraCure 971.
f. MAPEI Corporation; Mapelastic (PRP 315).
g. Southern Grouts & Mortars, Inc.; Southcrete 1100.
h. TEC, a subsidiary of H. B. Fuller Company; Triple Flex Waterproofing, Crack Isolation Membrane & Mortar.

## 2.5 CRACK ISOLATION MEMBRANE

General: Manufacturer's standard product that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated.

A. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

Bonsal American, an Oldcastle company; B 6000 Waterproof Membrane with Glass Fabric.
a. Bostik, Inc.; Hydroment Blacktop 90210.
b. Custom Building Products; 9240 Waterproofing and Anti-Fracture Membrane.
c. Laticrete International, Inc.; Laticrete Blue 92 Anti-Fracture Membrane.
d. MAPEI Corporation; Mapelastic L (PRP M19).
e. Summitville Tiles, Inc.; S-9000.

Latex-Portland Cement: Flexible mortar consisting of cement-based mix and latex additive.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

C-Cure; UltraCure 971.
f. MAPEI Corporation; Mapelastic (PRP 315).
g. TEC, a subsidiary of H. B. Fuller Company; Triple Flex Waterproofing, Crack Isolation Membrane & Mortar.

## 2.6 SETTING MATERIALS

Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Bonsal American; an Oldcastle company.
a. Bostik, Inc.
b. C-Cure.
c. Custom Building Products.
d. Laticrete International, Inc.
e. MAPEI Corporation.
f. Mer-Kote Products, Inc.
g. Southern Grouts & Mortars, Inc.
h. Summitville Tiles, Inc.
i. TEC; a subsidiary of H. B. Fuller Company.

Prepackaged, dry-mortar mix to which only water must be added.
2. For wall applications, provide nonsagging mortar.

## 2.7 GROUT MATERIALS

Sand-Portland Cement Grout: ANSI A108.10.

A. Polymer-Modified Tile Grout: ANSI A118.7.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Bonsal American; an Oldcastle company.
a. Bostik, Inc.
b. C-Cure.

c. Custom Building Products.
d. Jamo Inc.
e. Laticrete International, Inc.
f. MAPEI Corporation.
g. Southern Grouts & Mortars, Inc.
h. Summitville Tiles, Inc.
i. TEC; a subsidiary of H. B. Fuller Company.

Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.

## 2.8 ELASTOMERIC SEALANTS

General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."

Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

Products: Subject to compliance with requirements, provide one of the following:

DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
a. Dow Corning Corporation; Dow Corning 786.
b. GE Silicones, a division of GE Specialty Materials; Sanitary 1700.
c. Laticrete International, Inc.; Latasil Tile & Stone Sealant.
d. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.

Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.

Products: Subject to compliance with requirements, provide one of the following:

Bostik, Inc.; Chem-Calk 550.
e. Degussa Building Systems; Sonneborn Sonolastic SL 2.
f. Pecora Corporation; NR-200 Urexpan.
g. Sika Corporation; Sikaflex-2c SL.
h. Tremco Incorporated.; THC-900.

2.9 MISCELLANEOUS MATERIALS

Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

A. Metal Edge Strips: As indicated on drawings.

B. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

Products: Subject to compliance with requirements, provide one of the following:

Bonsal American, an Oldcastle company; Grout Sealer.
a. Bostik, Inc.; CeramaSeal Grout & Tile Sealer.
b. C-Cure; Penetrating Sealer 978.
c. Custom Building Products; Surfaceguard Grout Sealer.
d. Jamo Inc.; Penetrating Sealer.
e. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.
f. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
g. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
h. TEC, a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone Grout Sealer.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

3.2 PREPARATION

Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

A. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

B. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

C. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

## 3.3 INSTALLATION

Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:

Tile floors composed of tiles 8 by 8 inches or larger.

Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

A. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

B. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

C. Jointing Pattern: Lay tile in pattern indicated on drawings. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

D. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

Porcelain: 1/16 inch at wall installations; 3/16 inch at floor installations.

Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

E. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

1. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated, and additional locations as indicated on drawings.

F. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

G. Install cementitious backer units and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

H. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.

I. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.

## 3.4 INTERIOR TILE INSTALLATION SCHEDULE

Interior Floor Installations, Concrete Subfloor:

Tile Installation F125A: Thin-set mortar on crack isolation membrane; TCA F125A.

Tile Type: Porcelain Tile.

a. Thin-Set Mortar: Latex-portland cement mortar.
b. Grout: Polymer-modified sanded grout.

Interior Wall Installations, Metal Studs or Furring:

Tile Installation W244: Thin-set mortar on cementitious backer units or fiber cement underlayment; TCA W244.

Tile Type: Porcelain Wall Tile and Base at toilets.

c. Thin-Set Mortar: Latex- portland cement mortar.
d. Grout: Polymer-modified unsanded grout.

Tile Installation W245: Thin-set mortar on coated glass-mat, water-resistant gypsum backer board; TCA W245.

Tile Type: Porcelain Wall Tile and Base at areas other than toilets.
e. Thin-Set Mortar: Latex- portland cement mortar.
f. Grout: Polymer-modified unsanded grout.

END OF SECTION 093000

# SECTION 095113 - ACOUSTICAL PANEL CEILINGS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes acoustical panels and exposed suspension systems for interior ceilings.

Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

### 1.3 PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at Project site.

### 1.4 ACTION SUBMITTALS

Product Data: For each type of product.

Samples: For each exposed product and for each color and texture specified, 6 inchesin size.

### 1.5 INFORMATIONAL SUBMITTALS

Qualification Data: For testing agency.

A. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

B. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

C. Field quality-control reports.

### 1.6 CLOSEOUT SUBMITTALS

Maintenance Data: For finishes to include in maintenance manuals.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.

1. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.
2. Hold-Down Clips: Equal to 2 percent of quantity installed.
3. Impact Clips: Equal to 2 percent of quantity installed.

## 1.8 QUALITY ASSURANCE

Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Build mockup of typical ceiling area as shown on Drawings.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.9 DELIVERY, STORAGE, AND HANDLING

Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

A. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

## 1.10 FIELD CONDITIONS

Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

## 2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Flame-Spread Index: Class A according to ASTM E 1264.
1. Smoke-Developed Index: 450 or less.

## 2.3 ACOUSTICAL PANELS ACT 1 & 2

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Basis-of-Design Product: As noted on the drawings or comparable product by one of the following:

American Gypsum.
1. Armstrong World Industries, Inc.
2. Certain Teed Corporation
3. Chicago Metallic Corporation

Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50 percent.

Color: White.

C. Light Reflectance (LR): Not less than 0.89.

D. Ceiling Attenuation Class (CAC): Not less than 35.

E. Noise Reduction Coefficient (NRC): Not less than 0.80.

Edge/Joint Detail: Tegular.

F. Thickness: 7/8 inch.

Modular Size: 24 by 24 inches and 24 by 48 inches.

G. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.

## 2.4 METAL SUSPENSION SYSTEM

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Basis-of-Design Product:Subject to compliance with requirements, provide Armstrong World Industries, Inc., Compasso or comparable product by one of the following:

CertainTeed Corporation.
Chicago Metallic Corporation.
United States Gypsum Company.

Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.

Wide-Face, Capped, Double-Web,[ Fire-Rated,] Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30coating designation; with prefinished 15/16-inch-wide metal caps on flanges.

Structural Classification: Intermediate -duty system.
1. End Condition of Cross Runners: Override (stepped) type.
2. Face Design: Flat, flush.
3. Cap Material: Cold-rolled steel.
4. Cap Finish: Painted white .

## 2.5 ACCESSORIES

Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to [five] <Insert safety factor> times that imposed by ceiling construction, as determined by testing according to ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

Type: Postinstalled expansion anchors.

Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type i indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

Wire Hangers, Braces, and Ties: Provide wires as follows:

Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.135-inch- diameter wire.

## 2.6 METAL EDGE MOLDINGS AND TRIM

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Basis-of-Design Product:Subject to compliance with requirements, provide Armstrong World Industries, Inc., Prelude XL or comparable product by one of the following:

CertainTeed Corporation.
Chicago Metallic Corporation.
Fry Reglet Corporation.
Gordon, Inc.
United States Gypsum Company.

Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.

Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils . Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

A. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

A. Layout openings for penetrations centered on the penetrating items.

## 3.3 INSTALLATION

Install acoustical panel ceilings according to ASTM C 636/C 636Mand manufacturer's written instructions.

Suspend ceiling hangers from building's structural members and as follows:

Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

1. Splay hangers only where required[ and, if permitted with fire-resistance-rated ceilings,] to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
3. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more
t han 3 inches from ends. Miter corners accurately and connect securely.

## 3.4 ERECTION TOLERANCES

Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

A. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

## 3.5 CLEANING

Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

A. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

# SECTION 096513 - RESILIENT BASE AND ACCESSORIES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section Includes:

1. Resilient base.

Stair treads, risers and landings,
Resilient molding accessories.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 incheslong.

### 1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than Insert dimension for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg For more than 90 deg F.

1.6 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than Insert temperature or more than 95 deg F, in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
During installation.
48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC-RUBBER BASE Insert drawing designation

A. Manufacturers: Basis of Design: Refer to Finish Schedule in the drawings or provide comparable products by one of the following:
Flexco.
Johnsonite; A Tarkett Company. (Basis of Design)
Roppe Corporation, USA

B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).

1. Group: I (solid, homogeneous).
Style and Location:

a. Style A, Straight: Provide in areas with carpet.
Style B, Cove: Provide in areas with resilient flooring.

C. Thickness: 0.125 inch.

Height: As indicated on the drawings.

Lengths: Coils in manufacturer's standard length.

Outside Corners: Job formed or preformed.

Inside Corners: Job formed or preformed.

Colors: As noted on the drawings

## 2.2 RUBBER STAIR ACCESSORIES

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Armstrong World Industries, Inc.
Flexco.
Johnsonite; A Tarkett Company (Basis of Design)
Roppe Corporation, USA

C. Stair Treads: ASTM F 2169. Hammered texture

D. Separate Risers: Hammered, flat; in height that fully covers substrate; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

E. Stringers: Height and length after cutting to fit risers and treads and to cover stair stringers; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

F. Landing Tile: Matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

## 2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less.

B. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:

a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

C. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

## 3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

Do not stretch resilient base during installation.

On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

## 3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

Resilient Stair Accessories:

1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.

Tightly adhere to substrates throughout length of each piece.

For treads installed as separate, equal-length units, install to produce a flush joint between units.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

## 3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
Sweep and vacuum horizontal surfaces thoroughly.
Damp-mop horizontal surfaces to remove marks and soil.

B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

C. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

# SECTION 096813 - TILE CARPETING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes modular carpet tile.

A. Related Requirements:

Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

### 1.3 PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at Project site.

Review methods and procedures related to carpet tile installation including, but not limited to, the following:

Review delivery, storage, and handling procedures.

a. Review ambient conditions and ventilation procedures.
b. Review subfloor preparation procedures.
c. Transitions at other flooring finishes..

### 1.4 ACTION SUBMITTALS

Product Data: For each type of product.

Include manufacturer's written data on physical characteristics, durability, and fade resistance.

1. Include manufacturer's written installation recommendations for each type of substrate.

Shop Drawings: For carpet tile installation, plans showing the following:

Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.

2. Carpet tile type, color, and dye lot.
3. Pattern of Installation
4. Pattern Type, location, and direction
5. Type, color and location of inserts and borders
6. Type, color, location of edge, transition and other accessory strips
7. Transition details to other flooring materials.

Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

Carpet Tile: Full-size Sample.

8. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.

Samples for Initial Selection: For each type of carpet tile.

Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.

Product Schedule: For carpet tile. Use same designations indicated on Drawings.

B. Sustainable Product Certification: Provide ANSI/NSF 140 certification for carpet products.

## 1.5 INFORMATIONAL SUBMITTALS

Qualification Data: For Installer.

## 1.6 CLOSEOUT SUBMITTALS

Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.

1. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Carpet Tile: Full-size units equal to 3 percent of amount installed for each type indicated, but not less than 10 sq. yd..

## 1.8 QUALITY ASSURANCE

Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

## 1.9 DELIVERY, STORAGE, AND HANDLING

Comply with CRI's "CRI Carpet Installation Standard."

## 1.10 FIELD CONDITIONS

Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.

A. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

B. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

C. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

## 1.11 WARRANTY

Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.

1. Failures include, but are not limited to, the following:

   More than 10 percent edge raveling, snags, and runs.

   a. Dimensional instability.
   b. Excess static discharge.
   c. Loss of tuft-bind strength.
   d. Loss of face fiber.
   e. Delamination.

Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 CARPET TILE

Provide carpet tile as indicated on the drawings. See Room Finish Schedule and material Legend.

a. Basis of Design: As indicated on the drawings.

### 2.2 INSTALLATION ACCESSORIES

Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

A. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

VOC Content: 50 g/L or less.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

A. Examine carpet tile for type, color, pattern, and potential defects.

B. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. , and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

a. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

General: Comply with CRI's "CRI Carpet Installation Standards" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

A. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inchwide or wider, and protrusions more than 1/32 inchunless more stringent requirements are required by manufacturer's written instructions.

B. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

## 3.3 INSTALLATION

General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.

A. Installation Method: As recommended in writing by carpet tile manufacturer.

B. Maintain dye-lot integrity. Do not mix dye lots in same area.

C. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

G. Install pattern parallel to walls and borders.

## 3.4 CLEANING AND PROTECTION

Perform the following operations immediately after installing carpet tile:

Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.

1. Remove yarns that protrude from carpet tile surface.
2. Vacuum carpet tile using commercial machine with face-beater element.

Protect installed carpet tile to comply with CRI's "CRI Carpet Installation Standard," Section 20, "Protecting Indoor Installations."

B. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

# SECTION 099123 - INTERIOR PAINTING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section includes surface preparation and the application of paint systems on interior substrates.

1. Steel and iron.
2. Galvanized metal.
3. Aluminum (not anodized or otherwise coated).
4. Gypsum board.

### 1.3 DEFINITIONS

MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

A. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

### 1.4 ACTION SUBMITTALS

Product Data: For each type of product. Include preparation requirements and application instructions.

Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

1. Indicate VOC content.

Sustainable Design Submittals:

Product Data: For paints and coatings, indicating VOC content.

2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.

Samples for Initial Selection: For each type of topcoat product.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

Submit Samples on rigid backing, 8 inches square.

1. Apply coats on Samples in steps to show each coat required for system.
2. Label each coat of each Sample.
3. Label each Sample for location and application area.

Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

## 1.5 MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials, from the same product run,] that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Paint: 5 percent, but not less than 1 gal. of each material and color applied.

## 1.6 QUALITY ASSURANCE

Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Architect will select one surface to represent surfaces and conditions for application of each paint system.

Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..

a. Other Items: Architect will designate items or areas required.

Final approval of color selections will be based on mockups.

If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

2. 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

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.

Maintain containers in clean condition, free of foreign materials and residue.

1. Remove rags and waste from storage areas daily.

## 1.8 FIELD CONDITIONS

Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

A. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Basis-of-Design Product: Subject to compliance with requirements, provide PPG Architectural Finishes, Inc. or comparable product by one of the following:

Behr Process Corporation.

1. Benjamin Moore & Co.
2. Dulux (formerly ICI Paints); a brand of AkzoNobel.
3. Duron, Inc.
4. Glidden Professional.
5. Sherwin-Williams Company (The).

Products: Subject to compliance with requirements, provide one of the products listed in the Interior Painting Schedule for the paint category indicated.

## 2.2 PAINT, GENERAL

MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

A. Material Compatibility:

Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

1. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:

Flat Paints and Coatings: 50 g/L.

2. Nonflat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Rust-Preventive Coatings: 100 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Shellacs, Clear: 730 g/L.
9. Shellacs, Pigmented: 550 g/L.

Colors: As selected by Architect from manufacturer's full range.

Ten percent of surface area will be painted with deep tones.

## 2.3 SOURCE QUALITY CONTROL

Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

1. Testing agency will perform tests for compliance with product requirements.
2. 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.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

A. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

Concrete: 12 percent.
1. Masonry (Clay and CMUs): 12 percent.
2. Gypsum Board: 12 percent.

Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

A. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

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.

B. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

C. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
1. SSPC-SP 3.

Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

D. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

E. Aluminum Substrates: Remove loose surface oxidation.

## 3.3 APPLICATION

Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

Use applicators and techniques suited for paint and substrate indicated.
1. 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.
2. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
3. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
4. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. 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.

D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

Paint the following work where exposed in equipment rooms:

Equipment, including panelboards.
a. Uninsulated metal piping.
b. Uninsulated plastic piping.
c. Pipe hangers and supports.
d. Metal conduit.
e. Tanks that do not have factory-applied final finishes.
f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

Paint the following work where exposed in occupied spaces:

Equipment, including panelboards.
g. Uninsulated metal piping.
h. Uninsulated plastic piping.
i. Pipe hangers and supports.
j. Metal conduit.
k. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
l. Other items as directed by Architect.

Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

## 3.4 FIELD QUALITY CONTROL

Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

Contractor shall touch up and restore painted surfaces damaged by testing.
1. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

## 3.5 CLEANING AND PROTECTION

At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

A. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

B. 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.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

## 3.6 INTERIOR PAINTING SCHEDULE

Concrete Substrates, Traffic Surfaces:

Water-Based Concrete Floor Sealer System MPI INT 3.2G:

First Coat: Sealer, water based, for concrete floors, matching topcoat.

a. Topcoat: Sealer, water based, for concrete floors, MPI #99.

Curecrete Distribution, Inc.; Ashford Formula.

1) Euclid Chemical; Super Diamond Clear VOX 359ZZ.
2) PPG Architectural; Glidden Professional Concrete Coatings, Clear Acrylic SEaler 3214.
3) Sherwin Williams: H & C Wet Look Sealer, 50.048054.

CMU Substrates:

Epoxy-Based Concrete Masonry Unit System,

Block Filler: PPG 6-15 Speedhide Interior Exterior Latex Masonry Block Filler.

Intermediate Coat:Epoxy Latex, interior, matching topcoat.

PPG 98-1 Aquapon WB Water Base Semi Gloss Epoxy Coating.

Topcoat: Epoxy, interior, semi-gloss

PPG 98-1 Aquapon WB Water Base Semi Gloss Epoxy Coating.

Steel Substrates:

Hollow Metal Doors and Frames and structural steel above 8 feet above finish floor; Water-Based Light Industrial Coating System MPI INT 5.1B::

Prime Coat: Primer, rust inhibitive, water based MPI #107.

Benjamin Moore: Super Spec HP, Acrylic Metal Primer, 36.

4) PPG Architectural: PPG Paints, High Performance Coatingss, Pitt-Tech Plush Interior/Exterior DTM Industrial Primer, 90-908/909/912.
5) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Flat, B30W12651.

Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

b. Topcoat: Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5), MPI #153.

Benjamin Moore: SuperSpec HP, DTM 100% Acrylic SemiGloss, HP29/FP29.
1) PPG Architectural: Devoe Coatings, Devflex 4216 Waterborne Semi-Gloss.
2) PPG Architectural: High Performance Coatings, Pitt-Tech Plus Int/Ext. Semi-Gloss DTM Industrial Ename, 90-1210.
3) Sherwin-Williams: Pro Industrial, Acrylic Semi-Gloss Coating, B66W00651.

Water-Based Dry-Fall System MPI INT 5.1C:

Prime Coat: Shop primer specified in Section where substrate is specified. .

Topcoat: Dry fall, latex, flat[, MPI #118].

Benjamin Moore; Latex Dry Fall, flat, 395.
4) PPG Architectural; Glidden Professional, Waterborne Flat Dryfall, 1280.
5) PPG Architectural; Speedhide Super Tech Dryfall Primer and Finish, DP318XX.
6) Sherwin William; Pro Industrial Waterborne Acrylic Dryfall, B42W00181.

Galvanized-Metal Substrates:

Hollow metal doors and frames; Water-Based Light Industrial Coating System MPI INT 5.3K:

Prime Coat: Primer, galvanized, water based, MPI #134.

Benjamin Moore; Super Spec HP, Acrylic Metal Primer, P04/KP04.
7) PPG Architectural: High Performance Coating, 100% Acrylic DTM Industrial Primer, 90-912.
8) Rust-Oleum Universal Acrylic Primer, 278808.
9) Sherwin Williams; Pro Industrial, Pro-cryl Universal Primer, 2004/00/01.

Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

c. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 1), MPI #153.

Benjamin Moore: SuperSpec HP, DTM 100% Acrylic SemiGloss, HP29/FP29.

1) PPG Architectural: Devoe Coatings, Devflex 4216 Waterborne Semi-Gloss.
2) PPG Architectural: High Performance Coatings, Pitt-Tech Plus Int/Ext. Semi-Gloss DTM Industrial Ename, 90-1210.
3) Sherwin-Williams: Pro Industrial, Acrylic Semi-Gloss Coating, B66W00651.

Water-Based Dry-Fall System MPI INT 5.3H:

Prime Coat: Dry fall, water based, for galvanized steel, matching topcoat.

d. Topcoat: Dry fall, water based, for galvanized steel, flat (MPI Gloss Level 1), MPI #133.

Cloverdale Paiant Latex Acrylic Dryfall, 05138.

1) Diamond Vogel, Luminance 300, latex Dri-Mist Flat, MV-1518.

Gypsum Board Substrates:

Mildew-Resistant System, toilet rooms:

Prime Coat: Mildew-resistant Primer sealer.

Benjamin Moore: 532 Aura Waterborne Interior Bath and Spa Matte Finish.

2) PPG Architectural: Pure Performance, Interior latex primer, 9-900 Series.
3) Rust-Oleum; Zinsser Perma-White Mold & Mildew-Proof Interior paint, 02774.
4) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Primer, B28W02600.

Intermediate Coat: Latex, mildew-resistant, matching topcoat.

e. Topcoat for ceilings and soffits: Latex, mildew-resistant, flat (MPI Gloss Level 1).

Benjamin Moore: 532 Aura Waterborne Interior Bath and Spa Matte Finish.

1) PPG Architectural: Pure Performance, Interior Flat latex, 9-100 Series
2) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Flat,

B30W12651.

Topcoat for walls, unless noted otherwise: Latex, mildew-resistant (MPI Gloss Level 3).

Benjamin Moore: 524 Aura Waterborne Interior Eggshell Finish.

3) PPG Architectural: PPG Paints, Pure Performance Eggshell, 9-300XI Series.
4) Rust-Oleum; Zinsser Perma-White Mold & Mildew-Proof Interior paint, 02774.
5) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Flat, B30W12651.

Institutional Low-Odor/VOC Latex System MPI INT 9.2M:

Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.

Benjamin Moore: Eco Spec WB, Interior Latex Primer, N372/F372.

6) PPG Architectural: Glidden Professional, Lifemaster No VOC interior primer, 219-25.
7) PPG Architectural: PPG Paints, Speedhide Zero VOC latex sealer, 6-4900XI.
8) Sherwin-Williams: Pro-Mar 200 Zero Interior Latex Primer, B28W02600/B28WQ2600.
9) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Primer, B28W02600.

Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

f. Topcoat at ceilings and soffits: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1), MPI #143.

Benjamin Moore: Eco Spec WB, Interior Latex Flat Finish, N373/K373.

1) PPG Architectural: Glidden Professional, Lifemaster No VOC Interior Acrylic Flat, 512/K5112.
2) PPG Architectural: PPG Paints, Speedhide Zero VOC latex Latex Flat, 6-4110XI.
3) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Flat, B30W12651.

Topcoat at walls, unless noted otherwise: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3).

Benjamin Moore: Eco Spec WB, Interior Latex Flat Finish, N373/K373.

4) PPG Architectural: Glidden Professional, Lifemaster No VOC Interior Acrylic Flat, 512/K5112.
5) PPG Architectural: PPG Paints, Speedhide Zero VOC latex Latex Flat, 6-4110XI.

6) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Flat, B30W12651.

END OF SECTION 099123

# SECTION 102800 – TOILET AND BATH ACCESSORIES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

Section Includes:

Public-use washroom accessories.
1. Warm-air dryers.
2. Underlavatory guards.
3. Custodial accessories.

Related Requirements:

Section 09 30 00 TILING

### 1.3 COORDINATION

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.

A. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

### 1.4 ACTION SUBMITTALS

Product Data: For each type of product.

Include 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.

Samples: Full size, for each exposed product and for each finish specified.

Approved full-size Samples will be returned and may be used in the Work.

Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

Identify locations using room designations indicated.

3. Identify accessories using designations indicated.

## 1.5 CLOSEOUT SUBMITTALS

Maintenance Data: For accessories to include in maintenance manuals.

# PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.2 PUBLIC-USE WASHROOM ACCESSORIES

Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.

A. Basis of Design: Refer to Toilet Accessory Schedule on the drawings.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Product or by one of the following:

   A&J Washroom Accessories, Inc.

   a. American Specialties, Inc.; ASI Group.
   b. Bobrick Washroom Equipment, Inc.
   c. Bradley Corporation.

Mounting: Flanges with concealed fasteners.

2. Material: Stainless steel, 0.05 inch thick.

   Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.

3. Configuration and Length: As indicated on Drawings.

## 2.3 UNDERLAVATORY GUARDS

Underlavatory Guard

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

   Plumberex Specialty Products, Inc.
   a. Truebro by IPS Corporation.

Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.

2. Material and Finish: Antimicrobial, molded plastic, white.

## 2.4 MATERIALS

Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

A. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

B. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

C. 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.

D. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

## 2.5 FABRICATION

General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

A. 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

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.

A. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

## 3.2 ADJUSTING AND CLEANING

Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

A. Remove temporary labels and protective coatings.

B. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 102800

# SECTION 107326 – PRE-FAB WALKWAY COVERS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

This Section includes the following: Structural column supported prefabricated, prefinished canopies.

### 1.3 SYSTEM DESCRIPTION

General: Provide a complete, integrated set of canopy manufacturer's standard mutually dependent components and assemblies that form a canopy system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Include primary and secondary framing, metal roof panels, and accessories complying with requirements indicated.

Provide canopy system of size and with spacings, slopes, and spans indicated.

1. Canopy manufacturer is responsible for complete assembly including structural support, footing/foundation, canopy roof assembly and all miscellaneous connections and accessories.

### 1.4 PERFORMANCE REQUIREMENTS

Structural Performance: Provide canopy capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

Design Loads: As indicated on Drawings.

1. Live Loads: Include vertical loads induced by maintenance workers, materials, and equipment for roof live loads.
2. Roof Snow Loads: As indicated.
3. Deflection Limits: Engineer assemblies to withstand design loads with deflections no greater than the following:

   Purlins and Rafters: Vertical deflection of 1/240 of the span.

   a. Metal Roof Panels: Vertical deflection of 1/240 of the span.

Thermal Movements: Provide canopy that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

## 1.5 SUBMITTALS

Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

A. Shop Drawings: Show fabrication and installation details for canopy .

The canopy structure shall be designed by a licensed structural engineer in the jurisdiction of the installation. Signed and sealed drawings shall be provided.

1. Include plans, elevations, and at least 3/4-inch scale sections of typical members and other components. Show anchors, reinforcement, accessories, layout, and installation details.

Installation Drawings: Signed, dated, and sealed by a registered architect or professional engineer licensed in jurisdiction in which the project is located.

a. Show locations of electrical service connections.

Samples for Verification: For each type of product indicated, of size below:

Aluminum: For each form, finish, and color, on 6-inch- long sections of extrusions and squares of sheet at least 4 by 4 inches.

## 1.6 QUALITY ASSURANCE

Installer Qualifications: An authorized representative of canopy manufacturer for installation of units required for this Project.

A. Source Limitations: Obtain canopy components through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of canopy and are based on the specific types and models indicated. Refer to Division 01 Section "Product Requirements."

Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

Preinstallation Conference: Conduct conference at Project site.

## 1.7 DELIVERY AND HANDLING

Deliver canopy in protective covering and crating to protect components and surfaces against damage.

## 1.8 PROJECT CONDITIONS

Field Measurements: Verify actual dimensions of construction contiguous with canopy by field measurements and indicate on Shop Drawings.

## 1.9 COORDINATION

Coordinate installation of anchorages for canopy . Furnish setting drawings, templates, and directions for installing anchorages . Deliver such items to Project site in time for installation.

A. Coordinate delivery time so canopy systems can be installed within 24 hours of receipt at Project site.

## 1.10 WARRANTY

Warranty Period: Five years from date of Substantial Completion.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

Basis-of-Design Product: The design for each type of canopy is based on Mapes Architectural Self-supporting Canopies. Subject to compliance with requirements, provide either the named product or a comparable product by one of the following:

Dittmer Architectural Aluminum.

1. East Coast TVM, LLC.
2. Mapes Industries, Inc.
3. Mason-Florida, LLC.
4. Peachtree Protective Covers.
5. Perfection Architectural Systems, Inc.
6. Superior Metal Products Company, Inc.

## 2.2 MATERIALS

Aluminum Sheet and Plate: ASTM B 209,alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of alloy 5005-H15.

A. Aluminum Extrusions: Extruded Post, Roof Deck, Cap, Fascia: Alloy 6061-T6, 6063-T5, and 6063-T6 as called for by profile and design.

Thickness: As required by design, complying with minimum thickness requirement specified.

Aluminum Sheet: For miscellaneous trim only: Alloy 3105-H28 or 3004-H34; Minimum yield: 30 ksi; Minimum thickness 0.040 inch.

B. Threaded Rods: ASTM A 36/A 36M.

Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

## 2.3 INDEPENDENT SUPPORT-HUNG CANOPY

Basis-of-Design Product: Mapes Industries, Inc., (800) 228-2391, Lumishade Hanger Rod Canopy or a comparable product by one of the listed manufacturers.

All sizes and thickness shall be increased to meet span requirements and to resist design loads.

Deck: Extruded aluminum.

Thickness: Min. 0.078 inch.
1. Depth: 3-1/2 inches.
2. Interlocking flat bottom.

Fascia: Extruded aluminum.

Thickness: 0.124 minimum.
3. Depth: 8 inches.
4. J Style.

Intermediate Framing: Extruded aluminum.

Thickness: As required to meet performance requirements.

Hanger Rod: Manufacturers tested recommended assembly for performance requirements and attachment to structure.

B. Concealed Drainage: Intermediate troughs pitched to drain to gutters at rear of canopy and into downspouts.

## 2.4 ACCESSORIES

Fasteners: Use concealed fasteners fabricated from metals that are noncorrosive to canopy systems material and mounting surface.

A. Hardware:

Fasteners: Plated non-corrosive Type 18-8 stainless steel, sealed with neoprene "O" rings beneath flat washers.

1. Hanger Rod: Stainless steel, threaded to allow for adjustment to ensure drainage from canopy as indicated.

Anchors and Inserts: Use stainless steel or hot-dip galvanized anchors and inserts. Use torque-controlled expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete.

## 2.5 FABRICATION, GENERAL

General: Provide canopy systems consisting of extruded aluminum canopy supported on aluminum structural framing system, wall-hung and post supported, as indicated.

Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side.

1. Mill joints to a tight, hairline fit. Form joints exposed to weather to exclude water penetration.
2. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

## 2.6 STRUCTURE

Base: Provide canopy with integral base consisting of channels, angles, plates, or other fittings. Drill holes in members for anchor-bolt connection.

## 2.7 ALUMINUM FINISHES

Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. High-Performance Organic Finish: 2-coat fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Color and Gloss: As indicated on Exterior Color Schedule or Legend.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

Verify all dimensions existing and provided.

A. Make reasonable adjustments in fabrication and erection to provide an acceptable finished canopy .

### 3.2 INSTALLATION

General: Install canopy in strict accordance with manufacturer’s written recommendations and approved Shop Drawings.

A. Excavation: In firm, undisturbed or compacted soil, excavate canopy systems foundation to dimensions indicated.

B. Set anchor bolts and other embedded items required for installation of canopy systems. Use templates furnished by suppliers of items to be attached.

C. Install canopy systems level, plumb, and at height and slope indicated, with surfaces free from distortion or other defects in appearance.

Beams:

If mechanically fastened system, place beams in column notches and secure with proper number of fasteners as specified by size of beam and engineering. Ensure contact bearing in bottom of column notches; insert aluminum shim plates as necessary.

a. Level tops of beams to receive roof panels; roof panels shall drain rainwater into beams as indicated.
b. Minor connections and incidental details shall be as shown on the drawings.
c. Ensure that end caps are welded or mechanically fastened securely into place.

Hanger Rod: Attach hanger rod to imbedded anchor plate in accordance with approved shop drawings.

2. Roof Panels:

Fabricate roof panels to required lengths.

a. Install level and square to beams to avoid "out of square" conditions at beam ends.

b. Secure each contact point with a minimum of three stainless steel fasteners with 3/4 inch flat neoprene washers or other manufacturer tested and approved system.

Joint Sealants and Flashing:

Seal fabrication joints and seams away from view where required.

c. Seal all other points where water penetration might be expected.
d. Properly flash connection to walls where walkway cover units contact surface of building. Note: Sealants are not acceptable for closure/flashing between building and walkway cover system.

## 3.3 CLEANING

At completion of installation, clean soiled surfaces of canopy systems according to manufacturer's written instructions.

Remove protective film from members. Clean canopy of dirt, grease, handprints, and other blemishes. Leave area in a neat, clean, and acceptable condition.

Protect canopy from damage from other construction operations. Provide temporary barricades where necessary.

END OF SECTION 107326

SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Solid surface material countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.
4. Solid surface material apron fronts.

B. Related Requirements:
1. Division 22 " Plumbing Fixtures" for sinks and plumbing fittings.

1.3 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Sustainable Design Submittals:
1. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
2. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
1. Show locations and details of joints.
2. Show direction of directional pattern, if any.

D. Samples for Initial Selection: For each type of material exposed to view.

E. Samples for Verification: For the following products:
1. Countertop material, 6 inches square.
2. Wood trim, 8 inches long.
3. One full-size solid surface material countertop, with front edge and backsplash, 8 by 10 inches , of construction and in configuration specified.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance. B. Installer Qualifications: Fabricator of countertops.

C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.
1. Build mockup of typical countertop as shown on Drawings.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.8 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   a. Basis of Design as noted on the drawings
   b. E. I. du Pont de Nemours and Company.
   c.
   d. Formica Corporation.
3. Colors and Patterns: As noted on the drawings.

B. Composite Wood Products: Products shall be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.

C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 COUNTERTOP FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards." 1. Grade: Custom.

B. Configuration:
   1. Front: shape as indicated on drawings. .
   2. Backsplash: Straight, slightly eased at corner.
   3. End Splash: Matching backsplash.

C. Countertops: 3/4-inch- thick, solid surface material.

D. Backsplashes: 1/2-inch- thick, solid surface material.

E. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
   1. Fabricate with loose backsplashes for field assembly.
   2. Install integral sink bowls in countertops in the shop.

F. Joints: Fabricate countertops without joints where possible.

G. Joints: Fabricate countertops in sections for joining in field.
   1. Joint Locations: Not within 18 inches of a sink or cooktop and not where a countertop section less than 36 inches long would result, unless unavoidable.

H. Cutouts and Holes:
   1. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
   2. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

## 2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.
   1. Adhesives shall have a VOC content of 70 g/L or less.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."
   1. Sealanys shall have a VOC content of 250 g/L or less.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
   1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
   2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

G. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.

H. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
   1. Seal edges of cutouts in particleboard subtops by saturating with varnish.

I. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.16

# Fire Sprinkler System Specification Sheet

**(Per §40-10-250)**

## Project Data

Project name: Spartanburg Community College Terhune Building - Building Renovations

| **Location in South Carolina:** | Address (street # & name): 107 Community College Dr. | | State Project: ■ Yes ☐ No |
|---|---|---|---|
| | City: Spartanburg | County: Spartanburg | State Project #: H59-6288-JM |

## Water Supply Information

(Flow test data must be less than 1 year old per §40-10-250(A)(1))

| Date test conducted: 12 / 13 / 2024 | Static pressure (psi): Note 1 | Residual pressure (psi): Note 1 | Flow (gpm): Note 1 |
|---|---|---|---|
| **Distances of test gauges relative to the base of the riser:** | Horizontal (ft): Note 1 | Vertical (elevation difference in ft): Note 1 | |
| **Source of water supply:** | ☐ Municipal dead-end ☐ Municipal circulation ■ existing fire pump ☐ Other: | Pipe Size (in.): Note 1 | |
| **Test data by/from:** | Name: James Burke | Title: Inspector | |
| | Organization: Johnson Controls | Phone: 888 746 7539 | |
| **Fire pump:** Note 2 | ☐ New ■ Existing ☐ No Pump | Rated Pressure (psi): 75 | Churn Pressure (psi): 89 Rated |
| | | Rated Capacity (gpm): 750 | Pressure @ 150% flow (psi): 60 Rated |
| **On-site water storage:** | ☐ Yes ■ No | ☐ New ☐ Existing ☐ Tank ☐ Other: | Capacity (gal): |

## NFPA Hazard Classification

(Attach continuation page when necessary)

| Area # | Hazard Class or Code Reference | **Description of Hazard Protected** (including occupancy use group, and details of storage arrangement as applicable (including commodity class, rack arrangement/type, ceiling and storage height.)) |
|---|---|---|
| 1 | Light Haz | Offices, Common Spaces, Bathrooms |
| 2 | Ord 1 Haz | Storage Rooms |
| 3 | Ord 2 Haz | Bookstore Mercantile Areas |

## Design Parameters

(Attach continuation page when necessary)

| Area # | System Type | **Density**(gpm/ft²)/**Area**(ft²), **or Other** (Reference code sections) | **Inside Hose** (gpm) | **Outside Hose** (gpm) |
|---|---|---|---|---|
| 1 | Wet | .1/1500 or largest area per T 1923.1.1.1- Design Area Reduction of 19.2.3.2.3 allowed | NA | 100 |
| 2 | Wet | .15/1500 or largest area per T 1923.1.1.1- Design Area Reduction of 19.2.3.2.3 allowed | NA | 250 |
| 3 | Wet | .2/1500 or largest area per T 1923.1.1.1- Design Area Reduction of 19.2.3.2.3 allowed | NA | 250 |

| **Seismic Design Data:** | $S_s$=.269 | **Site Classification**=D | **Seismic Design Category**=C |
|---|---|---|---|

## Codes and Standards

(Attach continuation page when necessary)

**Applicable Codes, Standards, & Editions** (i.e. 2018 IBC, 2016 NFPA 13, etc.) **for the Scope of Work on the Fire Sprinkler System**

2019 NFPA 13, 2021 SCFC , 2021 SCBC / SC State Fire Marshall Rules and Regulations / SC Office of State Engineer Fire Dept Rules and Regulations

**Scope of work** (i.e. sprinkler system A.G. from 1'-0" A.F.F., U.G. from tap to 5'-0" outside, etc.) and **notes** (attach continuation page when necessary):

Scope of work begins at attachment to existing floor control valves at basement and first floor.
Note 1: Supply info is taken from existing firepump test report. Hydrant flow and location not relevant.
Note 2: Existing firepump test attached.

## Specifier's Information


Name: John D Miles, PE
Engineering services provided through a firm: ■ Yes ☐ No
Firm name: Miles Engineering Assoc, LLC
Address: 200 Oakhurst Rd
City: Blythewood
State: SC Zip: 29016
Phone: 803 391 2607 Fax:
E-mail: jmiles@milesengr.com





Certificate of Authorization




Professional Engineer's Seal

Revision No.: 1



Signature: John D Miles

Date: 06 20 2025

Form Version: July 1, 2021

# SECTION 21 00 00 – COMMON WORK RESULTS FOR FIRE SUPPRESSION

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. New fire sprinkler system/components (hereinafter "system"), including sprinkler heads, pipe, fittings, valves, connections, assemblies, hangers, seismic bracing, and other equipment, performing properly to protect the building and the building occupants.

### 1.02 RELATED SECTIONS

A. 21 Series Specifications and all general specifications that apply to all work on this project.

B. FSSSS – Fire Sprinkler System Specification Sheet

### 1.03 RELATED CODES AND STANDARDS

A. All work pertaining to the Fire Suppression System shall comply with all relevant codes and standards referenced on the Fire Sprinkler System Specification Sheet for Above Ground Sprinkler Systems.

B. The systems shall meet all federal, state and local codes and ordinances, and the installation must be inspected/accepted by all Authorities Having Jurisdiction (AHJ) as indicated in section 1.05 below..

C. Contractor shall contact the Fire Protection Engineer immediately for clarification if there is any discrepancy within the bid documents or between the referenced codes and the bid documents. In such a case the most stringent requirement must be followed.

### 1.04 SUBMITTALS

A. The Fire Sprinkler Contractor shall be responsible for document submittals to the FP Engineer. Contractor shall allow 7 working days for FP Engineer shop dwgs review. After FP Engineer approval, the FP Engineer will submit to the SC Office of State Fire Marshal.

B. Contractor shall not in any case begin work prior to receiving approval from Office of State Fire Marshal.

C. All work for this project shall be customized for the requirements of the building. Contractor shall coordinate and interface as necessary with all trades to establish the most practical/functional routing for the system piping in the space provided. Contractor shall review all bid drawings, not just the Fire Sprinkler Drawings, to coordinate with other crafts.

D. Contractor shall submit Data sheets/shop drawings, calculations, and manufacturer's descriptive literature for each component of the system as specified in SECTION 21 13 13 in one submittal.

E. Fire sprinkler shop drawings shall include all information required by NFPA 13 and by the fire sprinkler system specifications. See specification 21 13 13.

F. Contractor shall maintain at all times an up-to-date, marked set of as-built drawing at the site. Upon completion of the project, the contractor shall provide as-built drawings and all close-out documentation to the FP Engineer.

G. After satisfactory completion of testing in accordance with NFPA 13, and 72, and receipt of the signed test reports, the FP Engineer shall grant final approval and acceptance of the systems.

1.05 AUTHORITY HAVING JURISDICTION

A. SC OSFM, and SC Office of State Engineer are the AHJs. If questions arise regarding specifications/drawings for this project, the contractor shall contact the FP Engineer.

1.06 QUALIFICATIONS

A. It is mandatory that the sprinkler contractor use a qualified person who has passed examination for a minimum of NICET III in fire suppression systems to prepare shop drawings.

PART 2 PRODUCTS

2.01 STANDARD PRODUCTS

A. All fire suppression materials and equipment shall be Underwriters Laboratories (UL) listed or Factory Mutual (FM) approved.

B. Contractor shall provide materials and equipment that are standard products of a manufacturer regularly engaged in the manufacture of such products and that essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Contractor shall provide manufacturers catalog data on each component and material, and receive approval from the F P Engineer before installation.

C. All components shall be minimum 175 psi pressure rated. This includes all piping, fittings, valves, sprinkler heads and switches.

D. Symbols used on the shop drawings indicating any material, product or component (sway braces, restraints, seismic joint assemblies, hangers, etc.) used on this project shall be clear and shall conform to the standard symbols used in NFPA 13 and NFPA 72. All symbols,

abbreviations, and acronyms must be defined in the drawings in a clear manner in a table or legend.

E. Plain end type fittings/couplings or clamp fittings for sprinklers are not allowed. No on-site welding is permitted. All fittings shall be shop welded per AWS D10.9, Level AR-3 or shall be roll grooved for pipe sizes over 1-1/2" diameter. Hole-cut type Tee fittings are not acceptable/permitted on this project.

F. Couplings between piping (or between piping and fittings) of different diameters shall be of the concentric reducer type. Use of bushings is not acceptable/permitted on this project.

G. NOT USED

2.02 FIRE DEPARTMENT CONNECTION

A. NOT USED

PART 3 EXECUTION

3.01 PREPARATION

A. Contractor shall thoroughly flush the existing supply piping at point of connection before connecting to the existing system. Route flushing water through an open pipe end to the exterior of the building. Flush until the water runs clear.

3.02 INSTALLATION

A. This project includes/specifies all labor, material, equipment, services required for the contractor to install a complete/seismically braced/functional system in the building, and requires the contractor to provide, without extra cost to the Owner, any miscellaneous items, equipment, labor, services, incidentals not mentioned in the design, but necessary to complete the installation.

B. The contractor shall provide labor, material, equipment and services necessary for a proper and complete installation of each component for this project, and the installation shall be neat and workmanlike in all regards.

C. The contractor shall keep the work area neat/clean, and at the end of each work day, dispose of all scrap material/trash that accumulates around the work area.

D. The contractor shall install all fire suppression system pipe true to line and grade, with the weight of the pipe equally distributed on the hangers. Hangers that are visibly out of plumb will not be accepted.

E. Contractor shall notify the Architect and Fire Protection Engineer, in writing, when the work is sufficiently complete for a rough-in inspection, and for a final inspection.

F. The contractor shall be responsible for correct sizing of escutcheons, piping and each fire suppression component installed on this project.

G. Water flow devices and associated alarm circuits shall be flowed through the inspector's test connection. An audible on-premises alarm must begin within 3 minutes of beginning the flow, and must continue until the flow stops. The main drain valve shall be opened and remain open until the system pressure stabilizes. The static and residual pressure shall be recorded on the Contractor's Material and Test Certificate.

H. Any exposed piping shall be painted a color acceptable to the Architect. Acceptable manufacturers are Rose-Talbert, Sherwin-Williams, Benjamin-Moore, or equal. Surface preparation and primer as specified by the paint manufacturer shall be used.

## PART 4 ACCEPTANCE

### 4.01 ACCEPTANCE

A. Final approval and acceptance of the fire suppression systems shall be granted only after completion of acceptance testing specified in NFPA 13, 72, and the design documents, receipt of all required test documentation including Contractors Test and Materials Certificate, and approval by all Authorities Having Jurisdiction.

## PART 5 CLOSEOUT

### 5.01 DOCUMENTATION

A. The contractor shall provide two (2) bound booklets to Owner, each including:
   1) All required certifications required by the applicable NFPA Standard, including Contractor's Material and Test Certificates.
   2) Approved manufacturer's data for all system components.
   3) Maintenance and operating manuals, schedules and instructions.
   4) As-built drawings the same size as the shop drawings, for the fire suppression systems on paper media and on electronic media in CAD and pdf format.
   5) Hydraulic calculations and seismic calculations on paper media and on electronic media.
   6) NFPA 25, latest edition.

### 5.02 RISER ROOM- Fire Suppression System

A. Contractor shall provide in the firepump room near the system riser one of the (2) bound

booklets reqd to be provided to the Owner in 5.01 A. above.

END OF SECTION 21 00 00

# SECTION 21 05 18 – ESCUTCHEONS, PROTECTION OF PENETRATIONS, FOR FIRE-SUPPRESSION PIPING

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. All wall and ceiling penetrations for the fire suppression systems piping and equipment shall be provided with escutcheons.

### 1.02 RELATED SECTIONS / CODES

A. 21 Series Specifications and all general specifications that apply to all work on this project.
B. FSSSS – Fire Sprinkler System Specification Sheet

### 1.03 SUBMITTALS

A. Contractor shall submit Materials Data / Catalogue Sheets for Escutcheons plates for all wall and ceiling penetrations as one submittal per SECTION 21 00 00.

## PART 2 PRODUCTS

### 2.01 PIPE ESCUTCHEONS

A. Each escutcheon shall be designed to tightly fit the piping, sized to completely cover the penetration/opening and painted to match the color of the adjacent wall or ceiling. Each escutcheon shall be either one-piece or split pattern, held in place with an internal spring or setscrew. The installation shall be neat and workmanlike in all regards.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. The contractor shall be responsible for the correct sizing of all escutcheons.

B. Installation shall be neat and workmanlike in all regards.

C. All penetrations of fire-rated assemblies shall be fire-stopped in accordance with the 2021 SCBC, using a listed UL assembly. A flexible coupling shall be provided on each side of any

piping penetration of a fire-rated wall, each within 12 inches of the wall. All exterior wall or roof penetrations shall be sealed weather-tight.

D. Clean up any excessive fire stopping and weatherproofing material while the application is fresh, and before the sealant cures. Fire stopping and weatherproofing must be neat and workmanlike, and will not be accepted unless meeting the following criteria:
   1) Sealant must not extend more than ½" beyond the hole being sealed, measured along the surface of the fire rated membrane being penetrated.
   2) Sealant must not extend more than ½" out of the hole being sealed, measured perpendicular to the surface of the fire rated membrane being penetrated.

E. In finished building areas, contractor shall take all necessary actions to maintain the function and appearance of existing ceiling finishes, wall finishes, and floor finishes, as well as finishes of doors and trim.

3.02 ACCEPTANCE

A. Contractor shall conduct a visual inspection of installation to ensure that escutcheon completely covers the penetration/opening; is held tightly in place; and is painted to match the adjacent wall or ceiling

END OF SECTION 21 05 18

# SECTION 21 05 48 – SEISMIC CONTROLS FOR FIRE SUPPRESSION PIPING AND EQUIPT

## PART 1 GENERAL

1.01 SECTION INCLUDES

A. Contractor shall perform bracing and restraint of fire sprinkler system pipe; fittings; components; equipment; and assemblies, calculated to withstand seismic and other events that may occur in the project area. Contractor is responsible for providing and installing all necessary bracing and restraint members, trapeze members, and reinforcement members. Only rigid type bracing or restraint is allowed, cable bracing is not permitted.

1.02 RELATED SECTIONS / CODES

A. 21 Series Specifications and all general specifications that apply to all work on this project.

1.03 SUBMITTALS

A. Complete seismic calculations, assembly details, and Materials Data / Catalogue Sheets shall be submitted by the Contractor with the sprinkler shop drawings as per this section, NFPA 13, and the International Building Code.

B. Seismic Calculations should be completed with listed seismic calculations software, preferably software provided by the company that manufactures the seismic bracing components the contractor intends to install. Seismic bracing is designed, reviewed and installed as an assembly. The drawing details, the seismic calculations, and the materials data sheet must all match.

C. Product Data: Provide manufacturers catalogue information for the seismic bracing components to be used. Before installation, provide data from manufacturer and receive approval from the Project Fire Protection Engineer for the following devices and materials:
   1) Seismic components including piping, fasteners, joints, hanger straps, clamps

D. Shop Drawing Submittals: include the seismic Calculations, Details, and Materials Data with the Shop Drawings as per Project Specification 21 13 13.

1.04 DESIGNER QUALIFICATIONS

A. See Specification 21 00 00, Paragraph 1.06.

## PART 2 PRODUCTS

2.01 PIPE HANGERS, SUPPORTS, AND SEISMIC PROTECTION

A. Powder actuated fasteners are not permitted.

B. Fasteners used in hollow masonry walls shall be Listed and recommended by the manufacturer for such use.

C. Provide seismic restraining clips on all single set-screw beam clamps.

D. Attach hanger fasteners only to top chord of joist, truss, or top beam flange.

E. For steel joist pipe hanger vertical loading, no single pipe hanger load may exceed 50 LBS, no single joist may be loaded at more than 300 LBS, and there must be at least one panel point between single pipe hanger vertical loads to the same joist. EXCEPTION: Any joist loading specifically approved by the structural engineer is acceptable.

F. Use of Sammy Screw (screw with a drill tip) or other special listed fasteners must be used only in strict accordance with listing criteria and manufacturer's instructions.

G. When hanging from sloped surfaces, use a Listed swivel-type hanger to provide plumb hanger rod position without bending the hanger rod.

H. Hangers from z-purlin and z-beams must be fastened to the web and not the flange member. Do not fasten hangers to the sloping flange members.

I. Install and show on the contractor shop drawings all seismic design elements in accordance with NFPA 13. On the plan view and riser details drawings show the location of each seismic brace and flexible coupling. Provide a detail drawing for each type of seismic design element, including the following as a minimum:
   1) Sway bracing and 4-way riser bracing
   2) Branch line restraints
   3) Rigid and flexible couplings as needed
   4) Retaining straps on hanger C-clamp fasteners

J. When concrete decking is above the fire sprinkler piping, attach seismic bracing only to the concrete decking above, and not to steel joists. When no concrete decking is available above the fire sprinkler piping, attach seismic bracing to only the top flange or chord of beams, joists, and trusses. Do not attach seismic bracing to the bottom chord of a joist in any circumstance.

K. Attachment of a seismic brace to the structure with a C-clamp type fastener is not permitted, unless the clamp uses multiple set screws and is specifically Listed for use as a seismic brace fastener.

L. Use rigid bracing only, cable bracing is not permitted.

M. Sway brace load calculations are required and shall be submitted to the FP Engineer for approval at the same time as the shop drawings. Calculations shall be in a form that resembles the example calculation form shown in the 2022 NFPA 13.

N. Piping that passes through, over, or under any seismic building joint; or from the outer building to inner buildings; shall be provided with a seismic joint assembly in compliance with NFPA 13. The line where new construction adjoins an existing building shall be considered to be a seismic joint, unless specifically shown otherwise on the project FS bid drawings. Provide a 4-way brace on each side of the seismic joint assembly.

O. Contractor must not attach hangers or bracing to the structural members in such a way that the loading capacity of the structural member is exceeded. Especially see trusses and joists that have restrictions on the loading amount, loading orientation, and location of the loading on the member. In many cases the maximum spacing between hangers and braces as allowed by NFPA 13 cannot be achieved with these members, and additional hangers and braces must be installed. Contractor is responsible for coordination with the steel erector and fabricator to insure that allowable loading is not exceeded.

P. Symbols used on the drawings to show locations of hangers, sway braces, and seismic joint assemblies shall be clear and shall conform to the standard symbols used in NFPA 13.

## PART 3 EXECUTION

3.01 INSTALLATION

A. Seismic braces must be installed such that they are not eccentrically loaded. Longitudinal braces must be installed such that all bracing components are in the vertical plane intersecting the piping longitudinal centerline. Lateral braces must be installed such that all bracing components are in the horizontal plane intersecting the piping longitudinal centerline. The seismic requirements of NFPA 13, the International Building Code and Division 21 Specification shall be followed during installation of all equipment and piping for this project to provide a proper and complete fire sprinkler system installation.

B. Painted or galvanizing requirements for seismic bracing and/or restraint components is the same as the painting or galvanizing requirement for the fire sprinkler piping as per the FP dwgs and NFPA 13.

3.02 ROUGH-IN AND PUNCH LIST INSPECTIONS

A. Contractor must notify the Architect and Project Fire Protection Engineer, in writing, when the work is sufficiently complete for above-ceiling rough-in inspection.

**END OF SECTION 21 05 48**

# SECTION 21 13 13 – FIRE SPRINKLER SYSTEMS

## PART 1 GENERAL

1.01 SECTION 21 13 13 INCLUDES

A. Pipe, fittings, valves, connections, and equipment for fire suppression sprinkler systems.

1.02 RELATED SECTIONS / CODES

A. 21 Series Specifications and all general specifications that apply to all work on this project
B. FSSSS – Fire Sprinkler System Specification Sheet

1.03 SUBMITTALS TO FPE

A. Complete shop drawings, hydraulic calculations, seismic bracing calculations, and product data will be submitted to the FP Engineer for review. Provide all submittals in electronic format and one copy of all submittals in hard copy format. See specification 21 00 00 for further information.
B. Fire Sprinkler Shop drawings shall be drawn accurately to scale, in sheets of uniform size. Drawings and calculations will be computer generated; manual drawings or calculations will not be accepted. Show each system and its installation in detail, and include the following, as a minimum, as required by the appropriate NFPA standard and SC contractor licensing law:
    1) Project name and address.
    2) Name, address, and telephone number of the General Contractor and the Sprinkler Subcontractor.
    3) Each shop drawing sheet must bear the authorized signature and NICET number of the NICET III Technician that prepared the dwgs. Also must contain the name and SC Lic # of the fire sprinkler contractor. No shop drawings submittal will be reviewed without this information on each sheet.
    4) System plans showing pipe and heads layout for all new components of the renovated systems. Also show all existing supply piping from the firepump discharge to the new components of the renovated systems..
    5) Full height sections as necessary to describe the work. Provide at least two perpendicular cross sections completely across each area showing sprinkler system components such as piping, hangers, hanger fasteners, seismic bracing locations in the cross sections.
    6) Indicate, on the plans, the nominal diameter of pipe and show center-to-center pipe lengths, or cut lengths.
    7) Indicate, on the plans, the location of all control valves, check valves, drain points, and test connections.
    8) Show location and size of riser nipples, types and locations of all hangers and sleeves. Identify each type of hanger shown on the plan view drawing. Provide a detail of each type hanger used, including method of fastening to the structure.
    9) NOT USED
    10) NOT USED
C. Product Data: Provide manufacturers catalogue information. Indicate pipe actual diameters and schedule, valve friction losses and ratings including installation, maintenance, and testing

procedures, dimensions, wiring diagrams, etc. Where any devices, which are provided or furnished, involves work by another contractor, submit additional data copies directly to that contractor. Where any Materials Data Sheet indicates more than one size, style, color, etc, the contractor shall clearly indicate which items are to be used in the project. When submitting a packet of sheets, provide an index page listing all items included in the submittal. Include product data for the following devices and materials as applicable to this project:

1) All piping, fittings, and couplings, including MIC coating data
2) Control valves if reqd
3) Check valves, including alarm check valve and trim if reqd
4) Valve supervisory devices if reqd
5) All sprinkler heads
6) Sprinkler flexible connections
7) Water flow devices, tamper switches if reqd
8) Hangers including fasteners.
9) Penetration seals, including firestopping
10) Primer and Paint

D. Resubmittals:
   1) Contractor re-submittal shall indicate on each drawing sheet:
      a. Revision number, date, and description of the revision in the dwg sheet title block
      b. Revised portion of the dwg sheet shall be clouded and tagged with the correct revision number.
   2) Contractor re-submittal shall indicate in any revised calculations package:
      a. Revision number, date, and description of the revisions.
      b. Revised portion of the calculations shall be clouded and tagged with the correct revision number.

E. Project Record Documents: Maintain, at the site, an up-to-date marked set of as-built drawings. Upon completion of the project, the sprinkler contractor shall provide as-built drawings and additional closeout documentation as required by Specification SECTION 21 00 00 and this SECTION.

1.04 DESIGNER QUALIFICATIONS

A. See Specification 21 00 00, Paragraph 1.06.

**PART 2 PRODUCTS**

2.01 SYSTEM OPERATIONAL FEATURES

A. Contractor to install new closed head fire sprinkler system components to protect renovated spaces.

2.02 ABOVEGROUND PIPING AND COUPLINGS

A. Pipe Specifications: Pipe used shall meet or exceed the requirements of NFPA 13, Section 6.3. All pipe 1-1/2” diameter and less shall be steel Schedule 40, with threaded or grooved couplings. Pipe larger than 1-1/2” shall be steel Schedule 10, with welded or roll grooved couplings. All threaded pipe shall be minimum schedule 40. Pipe must meet ASTM Standard #A795, or #A135, or # A53.
B. Provide interior pipe coating to resist Microbiologically Influenced Corrosion.
C. Provide flexible couplings as required by seismic provisions of NFPA 13.

D. A stock of spare sprinklers shall be provided as required by NFPA 13. These shall correspond to the types and temperature ratings of the sprinklers in the property. They shall be kept in a cabinet located in the main riser room. A special sprinkler wrench shall also be provided and kept in the cabinet to be used in the removal and installation of sprinklers and nozzles. MODIFY EXISTING HEAD BOX AND CONTENTS AS NECESSARY.

2.03 PIPE HANGERS, SUPPORTS

A. Conform to Specification SECTIONS 21 00 00 & NFPA 13.
B. Contractor must not attach hangers or bracing to the structural members in such a way that the loading capacity of the structural member is exceeded. Especially see trusses and joists that have restrictions on the loading amount, loading orientation, and location of the loading on the member. In many cases the maximum spacing between hangers and braces as allowed by NFPA 13 cannot be achieved with these members, and additional hangers and braces must be installed.
C. NOT USED

2.04 NOT USED

2.05 DRAINS AND DRAIN VALVES

A. All low point drains shall be installed in accordance with NFPA 13, unless otherwise noted. An inspector's test connection with drain shall be installed in accordance with NFPA 13, for each flow alarm.
B. NOT USED
C. All sprinkler drain piping shall meet specifications of paragraph 2.02 of this SECTION,

2.06 NOT USED

2.07 NOT USED

2.08 NOT USED

2.09 SPRINKLER HEADS

A. All sprinkler heads shall be UL Listed quick response with NFPA 13 appropriate temperature ratings .

2.10 NOT USED

~~2.11~~ NOT USED

2.12 NOT USED-

**PART 3 EXECUTION**

3.01 INSTALLATION

A. The contractor shall provide labor, material, equipment, and services necessary for a proper and complete fire protection system as shown in these specifications and bid drawings.
B. Before connecting the new Level U1 and Level l fire sprinkler main to the existing fire sprinkler/standpipe riser, the combination sprinkler/standpipe riser must be flushed at

maximum firepump flow from the upper standpipe hose station, taking care to route the flow such that no property damage is done. Flush until the water is clear. Provide video or pics of this procedure to the FPE

C. The hydraulic calculations shall be based on the design criteria given on the Fire Sprinkler System Specification Sheet.
D. NOT USED.
E. A completed contractor's material and test certificate for above ground piping shall be developed by the contractor and submitted to the Owner, Spartanburg City Bldg and Fire Official, and FPE..
F. Avoid installation of fire sprinkler system components in zones above electrical system components where such installation is prohibited by the National Electrical Code. When such installation is unavoidable, contractor shall install non-combustible protective hoods over electrical equipment where directed by the AHJ. The only fire sprinkler piping allowed in electrical rooms is that fire sprinkler branch line piping required to supply the fire sprinkler heads in the electrical room.
G. Heads shall be installed at the center of tiles in acoustical tile ceilings.
H. See painting requirements of 21 00 00.

3.02 ACCEPTANCE TESTING

A. Contractor shall:
   1) Notify the Architect, Fire Protection Engineer, and City of Spartanburg of the time and date all required acceptance testing will be performed.
   2) Sign and complete the appropriate Contractor's Material and Test Certificate and provide original to the Owner.
B. Perform acceptance testing as required by NFPA 13 for aboveground piping.
   1) Hydrostatically pressure test all piping as required by NFPA 13. Provide to the Owner 2 copies and 1 original of properly completed "Contractor's Materials and Test Certificate" for above ground piping at completion of the job. Provide one copy to the Arch and FPE
   2) Piping shall be hydrostatically tested back to the beginning point of the contractor's work after new components of the system installation is complete with all sprinkler heads installed, the complete new system must be hydrostatically tested for 2 hours at 200 psi. EXCEPTION: Portions of a system subject to working pressures exceeding 150 psi shall be hydrostatically tested for 2 hours at a pressure 50 psi greater than the system working pressure. Drainage piping, and FDC piping, shall be tested and documented in the same manner as the sprinkler supply piping. Any drop in test gauge pressure or visible leakage during the 2 hours is unacceptable. Contractor shall repair all leaks.

3.03 ROUGH-IN AND PUNCH LIST INSPECTIONS

A. Contractor must notify the Architect and FPE, in writing. when the work is sufficiently complete for above-ceiling rough-in inspection.
B. Rough-in work is sufficiently complete for inspection only when all piping, and hangers are installed, and all piping is ready to be pressure tested. The FPE will witness above-ceiling piping 2-hour hydrostatic testing during above-ceiling rough-in inspection. Contractor shall hydrostatically pre-test the system to ensure that the test passes. If the test witnessed by the FP Engineer does not pass during the inspection, the contractor will be billed for the FP Engineer's return trip at the current site visit billing rate.
C. Contractor must notify the Architect and Fire Protection Engineer, in writing, when the work is sufficiently complete for final inspection. Give at least 5 full working days notice.

D. The system is sufficiently complete for final inspection only after installation of all sprinkler components, including all sprinkler heads, trim rings, drop assemblies, and any necessary head cabinet modifications. A 2-hour hydrostatic complete system test shall be conducted as part of the final inspection as well as testing of any new fire alarm interfaces with the sprinkler system. The contractor shall repair all leaks/defects found during final inspection.

END OF SECTION 21 13 13

# Fire Sprinkler System Specification Sheet

**(Per §40-10-250)**

## Project Data

Project name: Spartanburg Community College Terhune Building - Building Renovations

| **Location in South Carolina:** | Address (street # & name): 107 Community College Dr. | | State Project: ■ Yes ☐ No |
|---|---|---|---|
| | City: Spartanburg | County: Spartanburg | State Project #: H59-6288-JM |

## Water Supply Information

(Flow test data must be less than 1 year old per §40-10-250(A)(1))

| Date test conducted: 12 / 13 / 2024 | Static pressure (psi): Note 1 | Residual pressure (psi): Note 1 | Flow (gpm): Note 1 |
|---|---|---|---|
| **Distances of test gauges relative to the base of the riser:** | Horizontal (ft): Note 1 | Vertical (elevation difference in ft): Note 1 | |
| **Source of water supply:** | ☐ Municipal dead-end ☐ Municipal circulation ■ existing fire pump ☐ Other: | | Pipe Size (in.): Note 1 |
| **Test data by/from:** | Name: James Burke | Title: Inspector | |
| | Organization: Johnson Controls | | Phone: 888 746 7539 |
| **Fire pump:** Note 2 | ☐ New ■ Existing ☐ No Pump | Rated Pressure (psi): 75 | Churn Pressure (psi): 89 Rated |
| | | Rated Capacity (gpm): 750 | Pressure @ 150% flow (psi): 60 Rated |
| **On-site water storage:** | ☐ Yes ■ No | ☐ New ☐ Existing | ☐ Tank ☐ Other: Capacity (gal): |

## NFPA Hazard Classification

(Attach continuation page when necessary)

| Area # | Hazard Class or Code Reference | **Description of Hazard Protected** (including occupancy use group, and details of storage arrangement as applicable (including commodity class, rack arrangement/type, ceiling and storage height.)) |
|---|---|---|
| 1 | Light Haz | Offices, Common Spaces, Bathrooms |
| 2 | Ord 1 Haz | Storage Rooms |
| 3 | Ord 2 Haz | Bookstore Mercantile Areas |

## Design Parameters

(Attach continuation page when necessary)

| Area # | System Type | **Density**(gpm/ft²)/**Area**(ft²), **or Other** (Reference code sections) | **Inside Hose** (gpm) | **Outside Hose** (gpm) |
|---|---|---|---|---|
| 1 | Wet | .1/1500 or largest area per T 1923.1.1.1- Design Area Reduction of 19.2.3.2.3 allowed | NA | 100 |
| 2 | Wet | .15/1500 or largest area per T 1923.1.1.1- Design Area Reduction of 19.2.3.2.3 allowed | NA | 250 |
| 3 | Wet | .2/1500 or largest area per T 1923.1.1.1- Design Area Reduction of 19.2.3.2.3 allowed | NA | 250 |

| **Seismic Design Data:** | $S_s$=.269 | **Site Classification**=D | **Seismic Design Category**=C |
|---|---|---|---|

## Codes and Standards

(Attach continuation page when necessary)

**Applicable Codes, Standards, & Editions** (i.e. 2018 IBC, 2016 NFPA 13, etc.) **for the Scope of Work on the Fire Sprinkler System**

2019 NFPA 13, 2021 SCFC , 2021 SCBC / SC State Fire Marshall Rules and Regulations / City of Spartanburg Building Official and Fire Dept Rules and Regulations / USC Rules and Regulations

**Scope of work** (i.e. sprinkler system A.G. from 1'-0" A.F.F., U.G. from tap to 5'-0" outside, etc.) and **notes** (attach continuation page when necessary):

Scope of work begins at attachment to existing floor control valves at basement and first floor.
Note 1: Supply info is taken from existing firepump test report. Hydrant flow and location not relevant.
Note 2: Existing firepump test attached.

## Specifier's Information


Name:

Engineering services provided through a firm: ■ Yes ☐ No

Firm name: Miles Engineering Assoc, LLC

Address: 200 Oakhurst Rd

City: Blythewood

State: SC Zip: 29016

Phone: `803 391 2607 Fax:

E-mail: jmiles@milesengr.com





Certificate of Authorization




Professional Engineer's Seal

Revision No.: 1 Page 1 of 1 Signature: John D Miles

Form Version: July 1, 2021 Date: 05/20/2025

# FIRE PUMP

## Customer Information

**Name** Spartanburg Community College

## Building Information

**Name** Spartanburg Community College Dan L Terhune Building

**Address** 107 Community College Dr, Spartanburg, SC, 29303

## Inspection Information

**Name** Fire Pump

**SR#** 58928270

**Frequency** Annual

**Timezone** EDT

**Start Date** 12/13/2024

## Account Information

**Name** Johnson Controls North America

**Address** 50 Technology Drive, Westminster, MA, US, 1441

**Phone**

**Office License** 24699

**Date** 12/13/2024

**Inspector License** S.35532

## Contact Information

**Name** Brian Wallace

**Role** Facilities Engineer

**E-Mail** WallaceB@sccsc.edu

**Phone** 8645908740

## INSPECTION RESULTS SUMMARY

| DEVICE TYPE | INVENTORY COUNT | PASSED | FAILED | CANNOT INSPECT |
|---|---|---|---|---|
| Electric Fire Pumps | 1 | 1 | 0 | 0 |
| **TOTAL** | **1** | **1** | **0** | **0** |

## DEVICE DEFICIENCIES

**No device deficiencies in this inspection.**

# Electric Fire Pumps

| GENERAL DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PUMP LOCATIONE DESCRIPTION | BACKFLOW PRESENT | WATER SUPPLY TYPE | TANK SUPPLY | TANK CAPACITY | TANK HEIGHT | CONNECTION SIZE | DATE OF PUMP TEST | TIME OF PUMP TEST |
| PATTERSON 750 GPM ELECTRIC FIRE PUMP | Yes | City | N/A | N/A | N/A | 6" | 12/13 /2024 | 9:00 |

| FIRE PUMP DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MFG | SHAFT TYPE | MODEL | SERIAL NO. | RATED GPM | RATED PSI | CHURN / MAX PRESSURE | 150% PRESSURE RATING | RATED RPM |
| PATTERSON | Vertical | 6X6 VIP | FP-C039313 | 750 | 75 | 89 | 60 | 3560 |

| FIRE PUMP DRIVER DATA | | | | | | | | | | | JOCKEY PUMP DATA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MFG | MODEL | SERIAL NO. | RATED VOLTS | HORSE POWER | RATED RPM | RATED AMPS | PHASE | CYCLES | OPER VOLTS | SERVICE FACTOR | MFG | MODEL | SERIAL NO. |
| WEG | 0503603BE324JPV | 324JP 02/03 BG68470 | 460 | 50 | 3550 | 57 | 3 | 60 | 460 | 1.15 | GRUNDFOS | GRUNDFOS | CR1-10 U-FGJ-A-EE HQQE |

| FP CONTROLLER DATA | | | | JP CONTROLLER DATA | | | | |
|---|---|---|---|---|---|---|---|---|
| MFG | MODEL | SERIAL NO. | FP START | MFG | MODEL | SERIAL NO. | JP START | JP STOP |
| EATON | FD30-50-LMR-L1-X1-F | 16B-3048 | 130 | PATTERSON | FPJPC01360460 | P271 | 152 | 161 |

## Fire Pump Questions

| | |
|---|---|
| Time For Motor To Accelerate To Full Speed | Instant |
| Starting Pressure | 50 |
| Discharge Pressure While Running | 110 |
| Controller Selector Switch In Auto Position | Yes |
| Pump House Room at Least 40F | Yes |
| Suction, Discharge, And Bypass Valves Open | Yes |
| Piping Free Of Leaks | Yes |
| Suction And Discharge Pressure Gauges Normal | Yes |
| Controller Indicating Power On | Yes |
| Reverse Phase Alarm Indicator Off | Yes |
| Normal Phase Rotation Indicator On | Yes |
| Circulation Relief Valve Flows Water While Churning | Yes |
| Pump Started Automatically | Yes |
| Pump Run For At Least 10 Minutes (Elec Only) | Yes |
| Pump Packing Gland Shows Slight Discharge | Yes |
| Free From Unusual Noises Or Vibrations | Yes |
| Packing Boxes, Bearings, And Pump Casing Free Of Overheating | Yes |
| All Times And Pressures Acceptable | Yes |

| | |
|---|---|
| Isolation Switch And Circuit Breaker Exercised | Yes |
| Fire Pump Start Time | 9:00 |
| Fire Pump Stop Time | 9:20 |

| | |
|---|---|
| Electrical System Free Of Wire Chafing | Yes |

| | |
|---|---|
| Manual Starting Means On Electrical System Operated | Yes |

| | |
|---|---|
| Is there an External Means to View and Record the Amps and Voltage Readings? | Yes |
| Have Calibrated Gauges Been Used? | Yes |
| Inspect Pump Bearing Lubrication | Yes |
| Pump Coupling Alignment Acceptable | Yes |
| Circuit Breakers Passed Trip Test | Yes |
| Emergency Manual Starting Operated Without Power | Yes |
| Pressure Switch Settings Inspected | Yes |
| Control And Power Wiring Inspected | Yes |

## Annual Flow Test Results

| REVOLUTIONS PER MINUTE | DISCHARGE PRESSURE | SUCTION PRESSURE | NET PRESSURE | STREAM NO. | GPM | % | VOLTAGE | | | AMP READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L1 | L2 | L3 | L1 | L2 | L3 |
| 3582 RPM | 160 PSI | 50 PSI | 110 PSI | 0 | 0 | 0 % | 479 | 481 | 480 | 37 | 36 | 34 |
| 3562 RPM | 140 PSI | 50 PSI | 90 PSI | 1 | 754 | 100 % | 479 | 480 | 480 | 56 | 54 | 54 |
| 3560 RPM | 95 PSI | 35 PSI | 60 PSI | 2 | 1508 | 201 % | 480 | 479 | 480 | 60 | 59 | 60 |

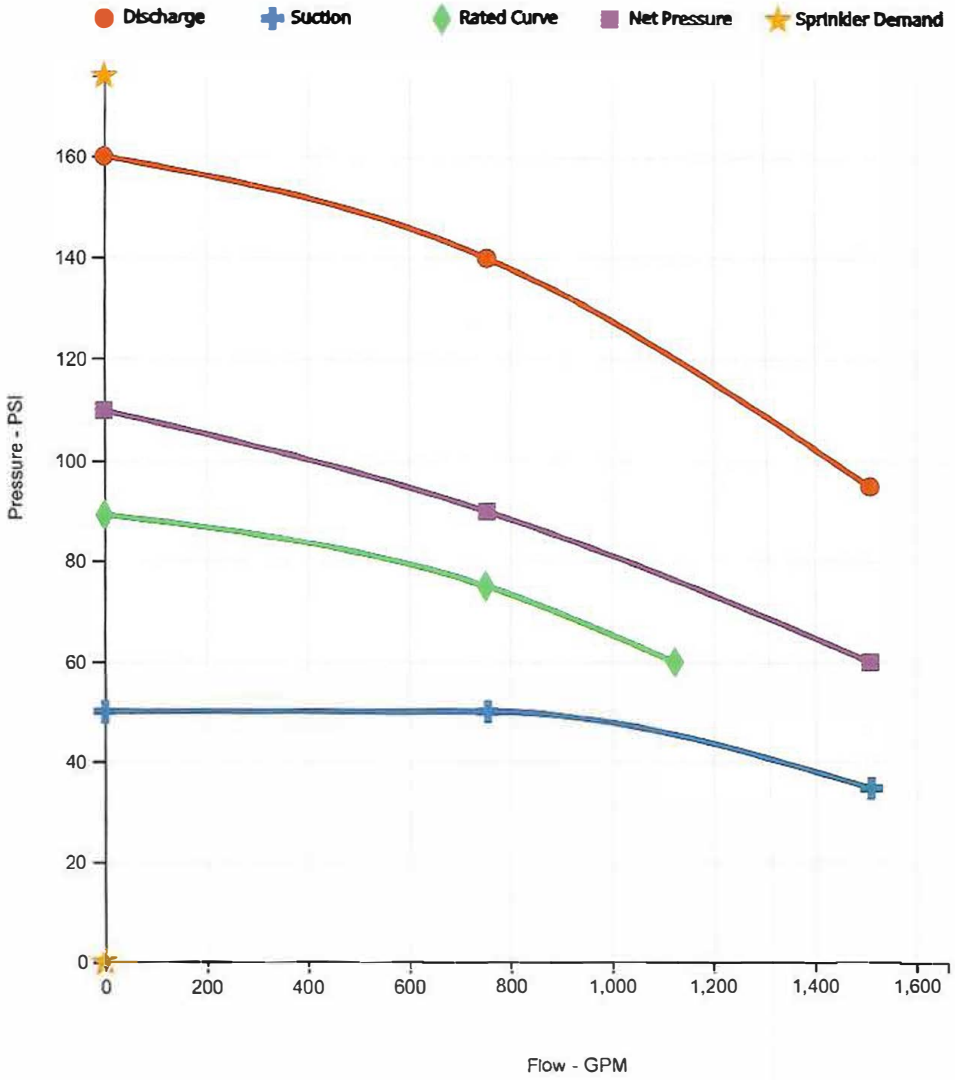
## FLOW INFORMATION

| Hose | 100% (Orifice size / Manufacturer of Testing Device) | 150% (Orifice size / Manufacturer of Testing Device) |
|---|---|---|
| Hose 1 | 2.5 / Hose monster | 2.5 / Hose monster |
| Hose 2 | — | 2.5 / Hose monster |
| Hose 3 | — | — |
| Hose 4 | — | — |
| Hose 5 | — | — |
| Hose 6 | — | — |
| Hose 7 | — | — |
| Hose 8 | — | — |
| Hose 9 | — | — |
| Hose 10 | — | — |
| Hose 11 | | — |
| Hose 12 | | — |
| Hose 13 | | — |
| Hose 14 | | — |
| Hose 15 | | — |

| INSPECTION RESULTS SUMMARY | |
|---|---|
| Fire Pump Operating Within Rated Specs | Pass |
| AMPS Within Rated Specs | Pass |
| VOLTS Within Rated Specs | Pass |
| Inspection Results | Pass |

| MOST DEMANDING SPRK. SYSTEM INFORMATION | |
|---|---|
| Most demanding system | |
| GPM | |
| PSI | |

## Fire Pump Performance Test



| | | | | | |
|---|---|---|---|---|---|
| **Inspector Signature** | | **Inspector Name** | James Burke | **Date** | 12/13/2024 |

# Terms And Conditions

1. **Limitation of Liability; Limitations Of Remedy.** It is understood and agreed by the Customer that Company is not an insurer and that insurance coverage, if any, shall be obtained by the Customer and that amounts payable to Company hereunder are based upon the value of the services and the scope of liability set forth in this agreement and are unrelated to the value of the Customer's property and the property of others located on the premises. Customer agrees to look exclusively to the Customer's insurer to recover for injuries or damage in the event of any loss or injury and that Customer releases and waives all right of recovery against Company arising by way of subrogation. Company makes no guaranty or Warranty, including any implied warranty of merchantability or fitness for a particular purpose that equipment or services supplied by Company will detect or avert occurrences or the consequences there from that the equipment or service was designed to detect or avert.<br />It is impractical and extremely difficult to fix the actual damages, if any, which may proximately result from failure on the part of Company to perform any of its obligations under this agreement. Accordingly, Customer agrees that, Company shall be exempt from liability for any loss, damage or injury arising directly or indirectly from occurrences, or the consequences therefrom, which the equipment or service was designed to detect or avert. Should Company be found liable for any loss, damage or injury arising from a failure of the equipment or service in any respect, Company's liability shall be limited to an amount equal to the agreement price (as increased by the price for any additional work) or where the time and material payment term is selected, Customer's time and material payments to Company. Where this agreement covers multiple sites, liability shall be limited to the amount of the payments allocable to the site where the incident occurred. Such sum shall be complete and exclusive. If Customer desires Company to assume greater liability, the parties shall amend this agreement by attaching a rider setting forth the amount of additional liability and the additional amount payable by the Customer for the assumption by Company of such greater liability, provided however that such rider shall in no way be interpreted to hold Company as an insurer. IN NO EVENT SHALL COMPANY BE LIABLE FOR ANY DAMAGE, LOSS, INJURY, OR ANY OTHER CLAIM ARISING FROM ANY SERVICING, ALTERATIONS, MODIFICATIONS, CHANGES, OR MOVEMENTS OF THE COVERED SYSTEM(S) OR ANY OF ITS COMPONENT PARTS BY THE CUSTOMER OR ANY THIRD PARTY. COMPANY SHALL NOT BE LIABLE FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO DAMAGES ARISING FROM THE USE, LOSS OF THE USE, PERFORMANCE, OR FAILURE OF THE COVERED SYSTEM(S) TO PERFORM. The limitations of liability set forth in this agreement shall inure to the benefit of all parents. subsidiaries and affiliates of Company, whether direct or indirect, Company's employees, agents, officers and directors.
2. **Limited Warranty.** COMPANY WARRANTS THAT ITS WORKMANSHIP AND MATERIAL FURNISHED UNDER THIS AGREEMENT WILL BE FREE FROM DEFECTS FOR A PERIOD OF NINETY (90) DAYS FROM THE DATE OF FURNISHING. Where Company provides product or equipment of others, Company will warrant the product or equipment only to the extent warranted by such third party. EXCEPT AS EXPRESSLY SET FORTH HEREIN, COMPANY DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE SERVICES PERFORMED OR THE PRODUCTS, SYSTEMS OR EQUIPMENT, IF ANY, SUPPORTED HEREUNDER. COMPANY MAKES NO WARRANTY OR REPRESENTATION, AND UNDERTAKES NO OBLIGATION TO ENSURE BY THE SERVICES PERFORMED UNDER THIS AGREEMENT, THAT COMPANY'S PRODUCTS OR THE SYSTEMS OR EQUIPMENT OF THE CUSTOMER WILL CORRECTLY HANDLE THE PROCESSING OF CALENDAR DATES BEFORE ORd AFTER DECEMBER 31, 1999.
3. **Indemnity.** Customer agrees to indemnify, hold harmless and defend Company against any and all losses, damages, costs, including expert fees and costs, and expenses including reasonable defense costs, arising from any and all third party claims for personal injury, death, property damage or economic loss, including specifically any damages resulting from the exposure of workers to Hazardous Conditions whether or not Customer pre-notifies Company of the existence of said hazardous conditions, arising in anydway from any act or omission of Customer or Company relating inlany way to this agreement, including but not limited to the Services under this agreement, whether such claims are based upon contract, warranty, tort (including but not limited to active or passive negligence), strict liability or otherwise. Company reserves the right to select counsel to represent it in any such action.
4. **Hazardous Materials.** Customer represents that, except to the extent that Company has been given written notice of the following hazards prior to the execution of this agreement, to the best of Customer's knowledge there is no:
    a. "permit confined space," as defined by OSHA, or space in which work must be performed that, because of its construction, location, contents or work activity therein, accumulation of a hazardous gas, vapour, dust or fume or the creation of a risk of infectious disease
    b. need for air monitoring, respiratory protection, or other medical risk
    c. asbestos, asbestos-containing material, formaldehyde or other potentially toxic or otherwise hazardous material contained in or on the surface of the floors, walls, ceilings, insulation or other structural components of the area of any building
    d. All of the above are hereinafter referred to as "Hazardous Conditions". Company shall have the right to rely on the representations listed above. If hazardous conditions are encountered by Company during the course of Company's work, the discovery of such conditions shall constitute an event beyond Company's control and Company shall have no obligation to further perform in the area where the hazardous conditions exist until the area has been made safe by Customer as certified in writing by an independent testing agency, and Customer shall pay disruption expenses and re-mobilization expenses as determined by Company. This agreement does not provide for the cost of capture, containment or disposal of any hazardous waste materials, or hazardous materials, encountered in any of the Covered System(s) and/or during performance of the Services. Said materials shall at all times remain the responsibility and property of Customer. Company shall not be responsible for the testing, removal or disposal of such hazardous materials.
5. **Equipment Disconnections.** This represents Company's notice to you that the system(s)/device(s) listed on the face of this agreement as temporarily or permanently disconnected are no longer in service and, thus, cannot detect, perform and/or report
6. **General**. Unless otherwise specified, work shall be performed during company's regular business hours,, exclusive of Saturdays, Sundays and Company holidays. All work is subject to review and rebilling in accordance with the terms and conditions of Customer's agreement/contract with Company, if one is in effect. Company shall not be responsible for failure to render services due to causes beyond its control, including but not limited to material shortages. work stoppages, fires, civil disobedience or unrest, severe weather, fire or any other cause beyond the control of Company. Customer is aware that the Limitation of Liability and other provisions set forth in any exisung agreement/contract, if one is in effect, or set forth above, apply to services performed and materials supplied. The terms of this agreement shall govern notwithstanding any inconsistent or additional terms and conditions in any purchase order or other document submitted by Customer.

## DEVICE NOTE IMAGE APPENDICES

# SECTION 21 05 18 – ESCUTCHEONS, PROTECTION OF PENETRATIONS, FOR FIRE-SUPPRESSION PIPING

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. All wall and ceiling penetrations for the fire suppression systems piping and equipment shall be provided with escutcheons.

### 1.02 RELATED SECTIONS / CODES

A. 21 Series Specifications and all general specifications that apply to all work on this project.
B. FSSSS – Fire Sprinkler System Specification Sheet

### 1.03 SUBMITTALS

A. Contractor shall submit Materials Data / Catalogue Sheets for Escutcheons plates for all wall and ceiling penetrations as one submittal per SECTION 21 00 00.

## PART 2 PRODUCTS

### 2.01 PIPE ESCUTCHEONS

A. Each escutcheon shall be designed to tightly fit the piping, sized to completely cover the penetration/opening and painted to match the color of the adjacent wall or ceiling. Each escutcheon shall be either one-piece or split pattern, held in place with an internal spring or setscrew. The installation shall be neat and workmanlike in all regards.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. The contractor shall be responsible for the correct sizing of all escutcheons.

B. Installation shall be neat and workmanlike in all regards.

C. All penetrations of fire-rated assemblies shall be fire-stopped in accordance with the 2021 SCBC, using a listed UL assembly. A flexible coupling shall be provided on each side of any piping penetration of a fire-rated wall, each within 12 inches of the wall. All exterior wall or roof penetrations shall be sealed weather-tight.

D. Clean up any excessive fire stopping and weatherproofing material while the application is fresh, and before the sealant cures. Fire stopping and weatherproofing must be neat and workmanlike, and will not be accepted unless meeting the following criteria:
   1) Sealant must not extend more than ½" beyond the hole being sealed, measured along the surface of the fire rated membrane being penetrated.
   2) Sealant must not extend more than ½" out of the hole being sealed, measured perpendicular to the surface of the fire rated membrane being penetrated.

E. In finished building areas, contractor shall take all necessary actions to maintain the function and appearance of existing ceiling finishes, wall finishes, and floor finishes, as well as finishes of doors and trim.

3.02 ACCEPTANCE

A. Contractor shall conduct a visual inspection of installation to ensure that escutcheon completely covers the penetration/opening; is held tightly in place; and is painted to match the adjacent wall or ceiling

END OF SECTION 21 05 18

# SECTION 21 05 48 – SEISMIC CONTROLS FOR FIRE SUPPRESSION PIPING AND EQUIPT

## PART 1 GENERAL

1.01 SECTION INCLUDES

A. Contractor shall perform bracing and restraint of fire sprinkler system pipe; fittings; components; equipment; and assemblies, calculated to withstand seismic and other events that may occur in the project area. Contractor is responsible for providing and installing all necessary bracing and restraint members, trapeze members, and reinforcement members. Only rigid type bracing or restraint is allowed, cable bracing is not permitted.

1.02 RELATED SECTIONS / CODES

A. 21 Series Specifications and all general specifications that apply to all work on this project.

1.03 SUBMITTALS

A. Complete seismic calculations, assembly details, and Materials Data / Catalogue Sheets shall be submitted by the Contractor with the sprinkler shop drawings as per this section, NFPA 13, and the International Building Code.

B. Seismic Calculations should be completed with listed seismic calculations software, preferably software provided by the company that manufactures the seismic bracing components the contractor intends to install. Seismic bracing is designed, reviewed and installed as an assembly. The drawing details, the seismic calculations, and the materials data sheet must all match.

C. Product Data: Provide manufacturers catalogue information for the seismic bracing components to be used. Before installation, provide data from manufacturer and receive approval from the Project Fire Protection Engineer for the following devices and materials:
1) Seismic components including piping, fasteners, joints, hanger straps, clamps

D. Shop Drawing Submittals: include the seismic Calculations, Details, and Materials Data with the Shop Drawings as per Project Specification 21 13 13.

1.04 DESIGNER QUALIFICATIONS

A. See Specification 21 00 00, Paragraph 1.06.

## PART 2 PRODUCTS

2.01 PIPE HANGERS, SUPPORTS, AND SEISMIC PROTECTION

A. Powder actuated fasteners are not permitted.

B. Fasteners used in hollow masonry walls shall be Listed and recommended by the manufacturer for such use.

C. Provide seismic restraining clips on all single set-screw beam clamps.

D. Attach hanger fasteners only to top chord of joist, truss, or top beam flange.

E. For steel joist pipe hanger vertical loading, no single pipe hanger load may exceed 50 LBS, no single joist may be loaded at more than 300 LBS, and there must be at least one panel point between single pipe hanger vertical loads to the same joist. EXCEPTION: Any joist loading specifically approved by the structural engineer is acceptable.

F. Use of Sammy Screw (screw with a drill tip) or other special listed fasteners must be used only in strict accordance with listing criteria and manufacturer's instructions.

G. When hanging from sloped surfaces, use a Listed swivel-type hanger to provide plumb hanger rod position without bending the hanger rod.

H. Hangers from z-purlin and z-beams must be fastened to the web and not the flange member. Do not fasten hangers to the sloping flange members.

I. Install and show on the contractor shop drawings all seismic design elements in accordance with NFPA 13. On the plan view and riser details drawings show the location of each seismic brace and flexible coupling. Provide a detail drawing for each type of seismic design element, including the following as a minimum:
   1) Sway bracing and 4-way riser bracing
   2) Branch line restraints
   3) Rigid and flexible couplings as needed
   4) Retaining straps on hanger C-clamp fasteners

J. When concrete decking is above the fire sprinkler piping, attach seismic bracing only to the concrete decking above, and not to steel joists. When no concrete decking is available above the fire sprinkler piping, attach seismic bracing to only the top flange or chord of beams, joists, and trusses. Do not attach seismic bracing to the bottom chord of a joist in any circumstance.

K. Attachment of a seismic brace to the structure with a C-clamp type fastener is not permitted, unless the clamp uses multiple set screws and is specifically Listed for use as a seismic brace fastener.

L. Use rigid bracing only, cable bracing is not permitted.

M. Sway brace load calculations are required and shall be submitted to the FP Engineer for approval at the same time as the shop drawings. Calculations shall be in a form that resembles the example calculation form shown in the 2022 NFPA 13.

N. Piping that passes through, over, or under any seismic building joint; or from the outer building to inner buildings; shall be provided with a seismic joint assembly in compliance with NFPA 13. The line where new construction adjoins an existing building shall be considered to be a seismic joint, unless specifically shown otherwise on the project FS bid drawings. Provide a 4-way brace on each side of the seismic joint assembly.

O. Contractor must not attach hangers or bracing to the structural members in such a way that the loading capacity of the structural member is exceeded. Especially see trusses and joists that have restrictions on the loading amount, loading orientation, and location of the loading on the member. In many cases the maximum spacing between hangers and braces as allowed by NFPA 13 cannot be achieved with these members, and additional hangers and braces must be installed. Contractor is responsible for coordination with the steel erector and fabricator to insure that allowable loading is not exceeded.

P. Symbols used on the drawings to show locations of hangers, sway braces, and seismic joint assemblies shall be clear and shall conform to the standard symbols used in NFPA 13.

## PART 3 EXECUTION

3.01 INSTALLATION

A. Seismic braces must be installed such that they are not eccentrically loaded. Longitudinal braces must be installed such that all bracing components are in the vertical plane intersecting the piping longitudinal centerline. Lateral braces must be installed such that all bracing components are in the horizontal plane intersecting the piping longitudinal centerline. The seismic requirements of NFPA 13, the International Building Code and Division 21 Specification shall be followed during installation of all equipment and piping for this project to provide a proper and complete fire sprinkler system installation.

B. Painted or galvanizing requirements for seismic bracing and/or restraint components is the same as the painting or galvanizing requirement for the fire sprinkler piping as per the FP dwgs and NFPA 13.

3.02 ROUGH-IN AND PUNCH LIST INSPECTIONS

A. Contractor must notify the Architect and Project Fire Protection Engineer, in writing, when the work is sufficiently complete for above-ceiling rough-in inspection.

**END OF SECTION 21 05 48**

# SECTION 21 13 13 – FIRE SPRINKLER SYSTEMS

## PART 1 GENERAL

1.01 SECTION 21 13 13 INCLUDES

A. Pipe, fittings, valves, connections, and equipment for fire suppression sprinkler systems.

1.02 RELATED SECTIONS / CODES

A. 21 Series Specifications and all general specifications that apply to all work on this project
B. FSSSS – Fire Sprinkler System Specification Sheet

1.03 SUBMITTALS

A. Complete shop drawings, hydraulic calculations, seismic bracing calculations, and product data will be submitted to the FP Engineer for review. Provide all submittals in electronic format and one copy of all submittals in hard copy format. See specification 21 00 00 for further information.
B. Fire Sprinkler Shop drawings shall be drawn accurately to scale, in sheets of uniform size. Drawings and calculations will be computer generated; manual drawings or calculations will not be accepted. Show each system and its installation in detail, and include the following, as a minimum, as required by the appropriate NFPA standard and SC contractor licensing law:
    1) Project name and address.
    2) Name, address, and telephone number of the General Contractor and the Sprinkler Subcontractor.
    3) Each shop drawing sheet must bear the authorized signature and NICET number of the NICET III Technician that prepared the dwgs. Also must contain the name and SC Lic # of the fire sprinkler contractor. No shop drawings submittal will be reviewed without this information on each sheet.
    4) System plans showing pipe and heads layout for all new components of the renovated systems. Also show all existing supply piping from the firepump discharge to the new components of the renovated systems..
    5) Full height sections as necessary to describe the work. Provide at least two perpendicular cross sections completely across each area showing sprinkler system components such as piping, hangers, hanger fasteners, seismic bracing locations in the cross sections.
    6) Indicate, on the plans, the nominal diameter of pipe and show center-to-center pipe lengths, or cut lengths.
    7) Indicate, on the plans, the location of all control valves, check valves, drain points, and test connections.
    8) Show location and size of riser nipples, types and locations of all hangers and sleeves. Identify each type of hanger shown on the plan view drawing. Provide a detail of each type hanger used, including method of fastening to the structure.
    9) NOT USED
    10) NOT USED
C. Product Data: Provide manufacturers catalogue information. Indicate pipe actual diameters and schedule, valve friction losses and ratings including installation, maintenance, and testing

procedures, dimensions, wiring diagrams, etc. Where any devices, which are provided or furnished, involves work by another contractor, submit additional data copies directly to that contractor. Where any Materials Data Sheet indicates more than one size, style, color, etc, the contractor shall clearly indicate which items are to be used in the project. When submitting a packet of sheets, provide an index page listing all items included in the submittal. Include product data for the following devices and materials as applicable to this project:

1) All piping, fittings, and couplings, including MIC coating data
2) Control valves
3) Check valves, including alarm check valve and trim
4) Valve supervisory devices
5) All sprinkler heads
6) Sprinkler flexible connections
7) Water flow devices, tamper switches
8) Hangers including fasteners.
9) Penetration seals, including firestopping
10) Primer and Paint
11) Sprinkler head trim rings

D. Resubmittals:
   1) Contractor re-submittal shall indicate on each drawing sheet:
      a. Revision number, date, and description of the revision in the dwg sheet title block
      b. Revised portion of the dwg sheet shall be clouded and tagged with the correct revision number.
   2) Contractor re-submittal shall indicate in any revised calculations package:
      a. Revision number, date, and description of the revisions.
      b. Revised portion of the calculations shall be clouded and tagged with the correct revision number.

E. Project Record Documents: Maintain, at the site, an up-to-date marked set of as-built drawings. Upon completion of the project, the sprinkler contractor shall provide as-built drawings and additional closeout documentation as required by Specification SECTION 21 00 00 and this SECTION.

1.04 DESIGNER QUALIFICATIONS

A. See Specification 21 00 00, Paragraph 1.06.

**PART 2 PRODUCTS**

2.01 SYSTEM OPERATIONAL FEATURES

A. Contractor to install new closed head fire sprinkler system components to protect renovated spaces of the third floor.

2.02 ABOVEGROUND PIPING AND COUPLINGS

A. Pipe Specifications: Pipe used shall meet or exceed the requirements of NFPA 13, Section 6.3. All pipe 1-1/2” diameter and less shall be steel Schedule 40, with threaded or grooved couplings. Pipe larger than 1-1/2” shall be steel Schedule 10, with welded or roll grooved couplings. All threaded pipe shall be minimum schedule 40. Pipe must meet ASTM Standard #A795, or #A135, or # A53.

B. Provide interior pipe coating to resist Microbiologically Influenced Corrosion.

C. Provide flexible couplings as required by seismic provisions of NFPA 13.
D. A stock of spare sprinklers shall be provided as required by NFPA 13. These shall correspond to the types and temperature ratings of the sprinklers in the property. They shall be kept in a cabinet located in the main riser room. A special sprinkler wrench shall also be provided and kept in the cabinet to be used in the removal and installation of sprinklers and nozzles. MODIFY EXISTING HEAD BOX AND CONTENTS AS NECESSARY.

2.03 PIPE HANGERS, SUPPORTS
A. Conform to Specification SECTIONS 21 00 00 & NFPA 13.
B. Contractor must not attach hangers or bracing to the structural members in such a way that the loading capacity of the structural member is exceeded. Especially see trusses and joists that have restrictions on the loading amount, loading orientation, and location of the loading on the member. In many cases the maximum spacing between hangers and braces as allowed by NFPA 13 cannot be achieved with these members, and additional hangers and braces must be installed.
C. NOT USED

2.04 NOT USED

2.05 DRAINS AND DRAIN VALVES
A. All low point drains shall be installed in accordance with NFPA 13, unless otherwise noted. An inspector's test connection with drain shall be installed in accordance with NFPA 13, for each flow alarm.
B. NOT USED
C. All sprinkler drain piping shall meet specifications of paragraph 2.02 of this SECTION,

2.06 NOT USED

2.07 NOT USED

2.08 NOT USED

2.09 SPRINKLER HEADS
A. All sprinkler heads shall be UL Listed quick response with NFPA 13 appropriate temperature ratings .

2.10 NOT USED

~~2.11~~ NOT USED

2.12 NOT USED-

**PART 3 EXECUTION**

3.01 INSTALLATION
A. The contractor shall provide labor, material, equipment, and services necessary for a proper and complete fire protection system as shown in these specifications and bid drawings.

B. Before connecting the new Level U1 and Level l fire sprinkler main to the existing fire sprinkler/standpipe riser, the combination sprinkler/standpipe riser must be flushed at maximum firepump flow from the upper standpipe hose station, taking care to route the flow such that no property damage is done. Flush until the water is clear. Provide video or pics of this procedure to the FPE
C. The hydraulic calculations shall be based on the design criteria given on the Fire Sprinkler System Specification Sheet.
D. NOT USED.
E. A completed contractor's material and test certificate for above ground piping shall be developed by the contractor and submitted to the Owner, Spartanburg City Bldg and Fire Official, and FPE..
F. Avoid installation of fire sprinkler system components in zones above electrical system components where such installation is prohibited by the National Electrical Code. When such installation is unavoidable, contractor shall install non-combustible protective hoods over electrical equipment where directed by the AHJ. The only fire sprinkler piping allowed in electrical rooms is that fire sprinkler branch line piping required to supply the fire sprinkler heads in the electrical room.
G. Heads shall be installed at the center of tiles in acoustical tile ceilings.
H. See painting requirements of 21 00 00.

3.02 ACCEPTANCE TESTING

A. Contractor shall:
   1) Notify the Architect, Fire Protection Engineer, and City of Spartanburg of the time and date all required acceptance testing will be performed.
   2) Sign and complete the appropriate Contractor's Material and Test Certificate and provide original to the Owner.
B. Perform acceptance testing as required by NFPA 13 for aboveground piping.
   1) Hydrostatically pressure test all piping as required by NFPA 13. Provide to the Owner 2 copies and 1 original of properly completed "Contractor's Materials and Test Certificate" for above ground piping at completion of the job. Provide one copy to the Arch and FPE
   2) Piping shall be hydrostatically tested back to the beginning point of the contractor's work after new components of the system installation is complete with all sprinkler heads installed, the complete new system must be hydrostatically tested for 2 hours at 200 psi. EXCEPTION: Portions of a system subject to working pressures exceeding 150 psi shall be hydrostatically tested for 2 hours at a pressure 50 psi greater than the system working pressure. Drainage piping, and FDC piping, shall be tested and documented in the same manner as the sprinkler supply piping. Any drop in test gauge pressure or visible leakage during the 2 hours is unacceptable. Contractor shall repair all leaks.

3.03 ROUGH-IN AND PUNCH LIST INSPECTIONS

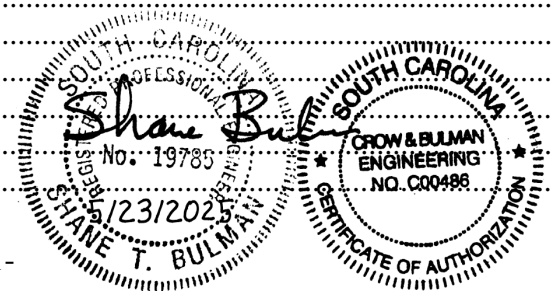
A. Contractor must notify the Architect and FPE, in writing. when the work is sufficiently complete for above-ceiling rough-in inspection.
B. Rough-in work is sufficiently complete for inspection only when all piping, and hangers are installed, and all piping is ready to be pressure tested. The FPE will witness above-ceiling piping 2-hour hydrostatic testing during above-ceiling rough-in inspection. Contractor shall hydrostatically pre-test the system to ensure that the test passes. If the test witnessed by the FP Engineer does not pass during the inspection, the contractor will be billed for the FP Engineer's return trip at the current site visit billing rate.

C. Contractor must notify the Architect and Fire Protection Engineer, in writing, when the work is sufficiently complete for final inspection. Give at least 5 full working days notice.
D. The system is sufficiently complete for final inspection only after installation of all sprinkler components, including all sprinkler heads, trim rings, drop assemblies, and any necessary head cabinet modifications. A 2-hour hydrostatic complete system test shall be conducted as part of the final inspection as well as testing of any new fire alarm interfaces with the sprinkler system. The contractor shall repair all leaks/defects found during final inspection.

END OF SECTION 21 13 13

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 be individually bondable in the state of South Carolina by a surety in accordance with AIA-201.

3. 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 the samples are 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 General Requirements specification section 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 Health and Environmental Control. 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.

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.

SEWER AND WATER MAIN CONNECTIONS:
Sewer: Connect to the existing sewer lines inside the building.

Water: Connect to existing domestic cold and hot water lines inside building.

Storm Drainage: Where indicated on the plans, connect to existing storm drainage piping inside building.

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.

UNDERGROUND PIPE:
Underground pipe shall be at depth to avoid action of freezing and frost, and not less than 30" deep, or as directed by Architect. Pipe under floors shall not undermine footings.

SEWER AND WATER SEPARATION:
Sewer and water separation on outside water and sewer piping shall be 10' horizontally or 18" vertically.

EXCAVATION AND BACKFILLING:
Contractor shall execute all excavation of trenches required for the work specified herein and after the work is in place shall backfill, with clay or sand first and black earth on top. Thoroughly tamp all earth.

All surplus earth shall be removed by Contractor from building and disposed of on site as directed by Architect. Provide necessary shoring for protection of trenches.

Trench backfill shall be compacted to 90% in non-traffic areas and 95% in traffic, floor slabs, and paved areas, based on Standard Proctor Test (ASTM 698). Backfill shall be tamped in a maximum of 12" layers.

Bedding and backfill for plastic sewer and storm water piping shall be per ASTM-D2321.

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, 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.

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. Underground Drain, Sewer, & Vents (PVC)
   All underground sanitary drains, vents, and storm drains shall be PVC, Schedule 40, plastic DWV piping and fittings. Pipe shall conform to ASTM D-2665 or D-1785, Standards and shall bear NSF seal of approval. Solvent cement shall conform to ASTM standard D-2564-88 and with purple primer ASTM F656. Pipe shall be installed per ASTM-2321.

   Bedding and backfilling shall be per ASTM D2321.

B. Above Ground Drain and Vents (Cast Iron):
All above ground sanitary drains, vents, downspouts, and storm drains shall be service weight, cast iron pipe and fittings. Pipe and fittings shall be asphaltum dipped, both inside and out.

Cast iron above grade shall be No-Hub pipe and fittings. Pipe shall conform to ASTM-A-888 and CISPI-301 standards with latest revisions. All pipe and fittings shall be made in the United States, marked with the collective trademark of the Cast Iron Soil Pipe Institute and listed by NSF International.

All sanitary drains and vents 1¼" and smaller, shall be Type "L" copper with sweat joints and wrought fittings (ASTM - F1476, ASTM - 1548).

Pipe shall be manufactured by Charlotte, Tyler or ABI.

C. 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.

PIPE JOINTS:

A. Cast Iron Pipe:
Underground: Joints shall be secured with electrometric compression gaskets. Gasket joints shall be made with neoprene seal with hub and spigot pipe. Gaskets shall meet ASTM C 564 and Cast Iron Soil Pipe Institute Standards.

Above Ground Sewer and Vent: Joints shall be made with No-Hub neoprene gaskets and stainless steel retaining sleeves. Gaskets and sleeves shall meet ASTM C 564, ASTM C 1277, CISPI 310, and Cast Iron Soil Pipe Institute Standards. Couplings shall bear the NSF trademark.

Downspouts: Joints shall be made with heavy duty No-Hub couplings. Clamps, straps, and shields shall be 304 stainless steel. Coupling shall comply with ASTM-1540 and shall be tested at 15psi minimum pressure. Couplings shall be Husky SD 4000, Clamp All 125, or Mission C400HW.

B. 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.

C. 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.

D. Existing or Dissimilar Materials DWV Pipe Connections: Connections to existing sewer, or connections between dissimilar pipe materials shall be made with extra- heavy duty No-Hub couplings. Clamps, straps, and shields shall be 304 stainless steel. Shields shall be 28 ga. minimum. Coupling shall comply with ASTM-1540, 1277, and 540, and shall be rated at 27 psi minimum test pressure (6”dia.), and torqued to 80 in.-lbs. or above.

Couplings shall be Fernco 5000 RC Strong Back, Clamp-All 120, or Husky 4000.

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. Inside Drainage and Vent System – The drainage and vent system shall be tested to a 10’ head of water above the top fixture of a fixture group. The water shall be kept in the system, or in the portion under test, for at least 15 minutes before the inspection starts; the system shall be tight at all points.

Final Drainage and Vent Test: The final test on the drainage and vent system shall be a visual smoke test using a pungent smoke. Prior to the smoke test, all fixtures must be installed and all traps filled with liquid. Once the drainage and vent system is filled with smoke, the vent outlets shall be closed and the system shall be pressurized to 1" water column for at least 15 minutes. Once pressurized, a visual inspection shall be performed on the system to verify no smoke is visible inside the building.

B. 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.

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

Gate Valves:
Stockham B-100 or B-108, Nibco T-111 or S-111, Crane #428 or #1334 Hammond #IB640 or IB635, Milwaukee #148 or 149, Grinnell #3010, Apollo #101T, Kitz #807

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 #IB413T or #IB423, Milwaukee, Kitz #811 or #812, Grinnell #3240, Apollo #121T

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

SHOCK ABSORBERS:
Provide water hammer arrestors at each water closet or group of water closets and elsewhere as noted on the drawings. Arrestors shall be certified per P.D.I. Standard WH-201 or ASSE 1010.

Arrestors shall be sized as follows:

1-3 Flush valves – Size "B"
4-6 Flush valves – Size "C"
7-11 Flush valves – Size "D"
12-15 Flush valves – Size "E"
16-33 Flush valves – Size "F"

Specified: Sioux Chief
Substitute: Josam, Zurn, Wade, Smith, PPP

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.

ROOF OPENINGS AND FLASHINGS:
Flashings for plumbing vent stacks through the built-up roof shall be made up from 4 lb. sheet lead, extending 18" away from outside of pipe and up to top of stack, with not less than 1" turned down into top of stack.

Single ply roofs shall have flashing furnished by the roofing manufacturer.

Flashings for plumbing vent stacks through the metal roof shall be "DEK-tite" by American Buildings Co. flexible seals furnished by this division but installed by the roofing contractor.

Vent stacks shall extend 8" above the roof line.

Do not install a vent within 10 ft. of an air intake device.

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.

Piping underground shall be installed on firm footing and be well supported as not to sag from settling of earth backfill.

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.

CLEANOUTS:

Floor cleanouts on interior horizontal lines shall be Smith Series 4020, or 4031cast iron with tapered thread bronze or plastic plugs and Nikaloy finish round access plate secure with countersunk brass screw. In carpeted areas, provide a chrome plated brass carpet marker.

Cleanouts located in floors with sheet membrane covering shall be Smith #2051-XP, with surface membrane flashing clamp.

Cleanouts in terrazzo floors shall be Smith Series 4180 or 4191 cast iron with tapered thread bronze or plastic plugs, Nikaloy finish round access plate with countersunk brass screw, and terrazzo recess. (Coordinate terrazzo material fill with G.C.)

Cleanouts on vertical lines and/or horizontal lines through wall shall be Smith Series 4472 with bronze or plastic plug and stainless steel round access plate secure to plug with countersunk brass screws. Install in a cast iron tapped tee.

Cleanouts outside of building shall be a recessed plug in a threaded hub, flush in 18"x18"x4" or 18" diameter x 4" concrete pad. Concrete pad shall be formed and poured with top flush with finish grade by the Plumbing Contractor.

Cleanouts outside of building in driveways or sidewalks shall be Smith Series 4250 or 4261 cast iron with recessed plug in a threaded hub. Cleanout shall have double flanged housing with heavy duty cast iron cover. At contractor's option, cleanouts in driveways or sidewalks may be recessed plug in threaded hub with US Foundry #7610 heavy duty cast iron valve box with removable 7" diameter lid.

All cleanouts shall have lubricated plugs with an anti-seize grease.

Specified: Jay R. Smith
Substitute: Wade, Zurn, Josam, Watts, Mifab

FLOOR DRAINS:
Refer to floor plan for location and type of special floor drains.

Unless noted otherwise, all other floor drains shall be Smith Series 2005A or 2010-A with medium duty reinforced nickel bronze grid strainer, trap primer tapping (where noted on drawings), Nikaloy finish with clamping ring. Strainer to be 5" diameter for 2" drains, and 7" diameter for 3" and 4" drains.

Floor drains located in floors with sheet membrane covering shall be Smith #2051, with surface membrane flashing clamp.

Mechanical room drains shall be Smith #2120 cast iron floor drain with bronze grate and inside caulk.

All floor drains shall have deep seal traps. As indicated on plans, provide additional protection as specified in the "FLOOR DRAIN TRAP PROTECTION" section of these specifications.

Specified: Jay R. Smith
Substitute: Wade, Zurn, Josam, Watts, Mifab

FLOOR DRAIN TRAP PROTECTION:
All floor drains, trough drains, and hub drains shall have deep seal traps. Additional protection shall be provided as indicated on the floor plans as follows:
Provide a flexible trap sealer insert. Insert shall be tested and certified to the ASSE 1072 standard. Sealer shall be installed in drain without caulking, sealing, or glue.

Trap sealers shall not be installed in drains until after final cleaning has been completed.

Specified: "Green Drain"
Substitute: RectorSeal “SureSeal”, Smith “Quad Close – Trap Seal”; IPS “Trap-Tite”; Mifab “Mi-Guard”, Zurn “Z-Shield”

ICE MACHINE SUPPLY BOX:
Ice machine box shall be ABS construction and have 1/4" compression outlet, 1/2" sweat supply, integral service valve, and water hammer arrestor. Arrester shall be certified to ASSE 1010 and shall be UPC listed. Unit shall allow mounting with supply line from top, bottom, or side.

Specified: Sioux Chief "Ox Box" 696 Series

RECESSED HOT & COLD WATER SUPPLY BOX:
Hot and cold water supply box shall be ABS construction and have 3/8" compression outlets, 1/2" sweat supply inlets, integral service valves, and water hammer arrestor at each inlet. Arrester shall be certified to ASSE 1010 and shall be UPC listed. Unit shall allow mounting with supply line from top, bottom, or side.

Specified: Sioux Chief "Ox Box" 696 Series

WASHING MACHINE SUPPLY AND DRAIN BOX:
Supply box shall be ABS construction and have double hose bib outlet connections. Unit shall be provided with integral service valves and water hammer arrestor. Arrester shall be certified to ASSE 1010 and shall be UPC listed. Unit shall allow mounting with supply line from top or bottom. Provide with separate ABS construction drain box. Provide wall flanges for both the supply and drain box.

Specified: Sioux Chief - "Ox Box" 696 Series

AIR ADMITTANCE VALVES:
Standard Air admittance valves shall be ABS with silicon membrane and NSF 14 / ASSE 1051 listed.

Plenum-rated Air admittance valves shall be constructed of flame-retardant polycarbonate resin with elastromeric membrane. Valves shall be classified in accordance with UL2043 for installation in plenums and ASSE 1051 listed.

Air admittance valves serving science sinks shall be constructed of flame-retardant, acid-resistant polypropylene (ASTM D-4101) with EDPM O-ring. Valve shall be designed for use in non-neutralized chemical waste systems. Valve shall be listed to NSF 14 and ASSE 1049.

Air admittance valves shall be installed per manufacturer's installation instructions.

Specified: Studor "MINI-VENT" or "MAXI-VENT" (standard)
Studor "TEC-VENT" (plenum application)
Studor "CHEM-VENT" (acid resistant)
Substitute: By prior approval.

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.

DIELECTRIC UNIONS:
Furnish and install dielectric union or couplings at all connections of dissimilar metals and electrical operated devices.

DRAINS:
All water piping shall be run free of traps, slightly pitched and so arranged that it will drain to low points of the system. These points shall be provided with accessible drain valve for the complete drainage of the system.

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 |
| Flush Valves: | Sloan, Zurn, Kohler |
| Seats: | Beneke, Bemis, Church, Centoco, or by fixture manufacturer |
| Electric Water Coolers: | Oasis, Elkay, Halsey Taylor, Sunroc, Haws, Murdock |
| Sinks: | Elkay, Just, Acorn |
| Precast Basin: | Stern-Williams, Fiat, Florestone, 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.
Floor mounted water closets shall be secured with solid brass closet bolts. Wall hung water closets shall have heavy duty steel/ductile iron carriers, minimum 500 lb load rating. Coordinate carrier dimensions with available chase size.

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.

All toilet seats shall have self-sustaining hinges with stainless steel posts and nuts.

P-1 Water Closet (ADA) (wall hung, flush valve): Kohler "Kingston", #K-84325, wall hung, vitreous china, siphon jet, elongated bowl toilet with "lustra" #K-4666 C extra heavy duty, white, open front toilet seat with self-sustaining hinge. Furnish with a Sloan Optima Royal #110ES-S with (2) chrome plated brass cover plates, chromed brass solenoid valve, transformer and over-ride button, and true-mechanical override. Provide wall carrier, see "A" drawings for chase size.

P-2 Water Closet (wall hung, flush valve): Kohler "Kingston" #K-84325, wall hung, vitreous china, siphon jet, elongated bowl toilet with "lustra" #K-4666C extra heavy duty, white, open front toilet seat with self-sustaining hinge. Furnish with a Sloan Optima Royal #110ES-S with (2) chrome plated brass cover plates, chromed brass solenoid valve, transformer and over-ride button, and true-mechanical override. Provide wall carrier, see "A" drawings for chase size.

P-3 Lavatory (ADA): Kohler "Farmington" #K-2905 enameled cast iron, self-rim-ming 19"x 16", oval counter top lavatory with Chicago #802 faucet with lever handles 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.

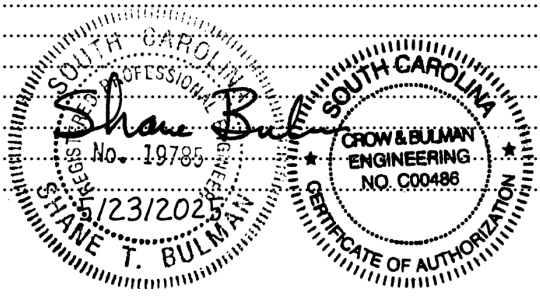
P-4 Sink (Kitchen): Just #DL-1933-A-GR stainless steel, 18 gauge, 19"x 33"x 7 ½" deep, double compartment sink. Furnish with a Chicago #1102 eight inch high swing spout faucet with hand spray and with aerator. Furnish with Just #J35 STP basket strainer.

P-5 Electric Water Cooler (Bottle Filler, Bi-Level): Halsey Taylor #HTHB-HAC8FBL wall hung, bi-level water cooler for the handicapped with filtered bottle filler, 8.0 GPH delivery at $90^0$F ambient and $80^0$F inlet water, front push bar control, and stainless steel cabinet.

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 be individually bondable in the state of South Carolina by a surety in accordance with AIA-201.

3. 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 7-8 rated efficiency during construction, and shall be replaced with MERV 7-8 at date of occupancy. Any return air ductwork, openings, and/or air devices shall be protected with MERV 7-8 filter media.

Refer to General Requirements section of the specification 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.

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 General Requirements specifications section.

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 the Engineer with a signed statement from the owner's representative acknowledging receipt of extra air filters, where required by these equipment specifications.

H. Furnish a letter certifying installation of Code required Seismic restraints.

I. Provide a letter from the chemical treatment contractor that all required piping systems are flushed, cleaned, and passivated.

J. 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.

K. 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.

Where indicated in these specifications, some materials or equipment may require (or offer) an extended warranty (See individual Specification paragraphs)
Refrigeration Compressors – 5 years (non pro-rated)
Variable Speed Drives – 2 years

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).

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) All roof, wall, and floor mounted gas piping.
3) Suspended gas piping over 2" diameter, if suspended greater than 12" from the structure.

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:
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 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

Gate Valves:
125 pound S.W.P., bronze, screwed ends, inside screw, solid wedge, screwed bonnet, rising stem, repackable under pressure, U.S. made:
Hammond #640, Crane #428, NIBCO #T-111, Grinnell #3010, Stockham B-100, Milwaukee #148, Apollo #101T.

Ball Valves:
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 for chilled water service 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:
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

Gate Valve:
125 pound S.W.P. O.S. & Y., iron body, solid wedge, bolted bonnet, flanged ends, U.S. made: Nibco #F-617-0, Hammond #IR1140, Stockham G623, Crane 465-1/2, Milwaukee #T-2885, Grinnell #6020A, Apollo #611F.

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 #751, 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

Gate Valve: 125 pound S.W.P., bronze, screwed ends, inside screw, solid wedge, screwed bonnet, rising stem, repackable under pressure, U.S.made: Hammond #640, Crane #428, NIBCO #T-111, Grinnell #3010, Stockham B-100, Milwaukee #148

Ball Valves: 400 pound WOG, bronze, screwed ends, double TE seals and seats, full port, 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:
Test per paragraph D.2; Hydrostatic Test @ 150 psig. (prior to insulating pipe)

At the final inspection of the project, the piping system shall again be tested at 100 psig. (Excluding the boiler and other low pressure equipment).

F. 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).

Any connections with galvanized iron or copper pipe to a stainless steel drain pan shall have a dielectric coupling. Any connections to a galvanized or stainless steel drain pan shall have a threaded brass/bronze union/nipple.

Underground: condensate drains shall be 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:
Galvanized iron pipe with threaded and screwed connections and fittings. Testing not required.

G. 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=$\underline{0.27 \text{BTU-in}/(\text{h-F-ft}^2)}$, 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. 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

H. 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' |

   Light weight joist and purlin construction:

| pipe size | ¾" | 1" | 1-½" | 2" | 2-1/2" | 3" | 4"-6" | 8" | |
|---|---|---|---|---|---|---|---|---|---|
| max.spacing | 7' | 7' | 9' | 10' | 10' | 10' | 10' | 10' | Parallel to Purlins |
| | 5' | 5' | 5' | 10' | 10' | 10' | 5' | 5' | Perpendicular to Purlins |

   NOTE: 4" Pipe and larger and run parallel to purlins shall have the threaded rod attached to a unistrut support secured to a minimum of 3 purlins (8" or 6" pipe) or 2 purlins (for 4" pipe). See detail on drawings.

   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.

I. Pipe Installation:
1. Weld-o-lets shall be acceptable in lieu of tees where branch is two sizes smaller than main.

2. All underground pipe shall have a minimum bury depth of 3 feet (top of pipe to grade) unless indicated otherwise on the plans.

3. 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.

4. Provide all sensing wells and tappings necessary to accommodate the control system, and water treatment system. Coordinate with subcontractors.

5. Unless noted otherwise, all piping shall be located above the ceiling. Where exposed in a mechanical room, 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.

6. All pipe mounted indicating thermometers and gages shall be installed and adjusted to be read from floor level, without need for a ladder.

7. Earthquake Restraints: Refer to Seismic Restraint section of these specifications.

8. 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.

J. 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. Automatic Flow Control Valves:
   Provide auto-flow control valves at each terminal unit as scheduled on the drawings. Valves shall have cast brass body with stainless steel or nickel plated brass cartridge and stainless steel spring. The valve shall be rated for 300 psi, $250^0$F, threaded ends, and have a threaded union with bonnet nut for disassembly. The valve body shall have ¼" NPT pressure and temperature test ports with EPDM seals to receive pressure gauge or thermometer. Valves shall have accuracy of 5% + over the entire pressure range specified on the drawings. Auto flow cartridge shall be protected by a #20 mesh strainer upstream from the valve.

   Specified: Auto Flow
   Substitute: Griswold, Nexus, Wheatley, Hays, Pro Hydronic Specialties, Bell & Gossett, Victaulic, Tour & Andersson, IMI Flow Design

5. 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, or IMI Flow Design

6. Flexible Connection Hoses:
For terminal equipment branch pipe connectors 1½" and smaller, where indicated on the plans. 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.

K. Thermometers and Gauges:
Furnish and install thermometers and gauges where shown on the drawings.

1. 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.

2. Digital Thermometers:
Thermometers shall have cast aluminum housing, accuracy +/- 1 degree F, light powered minimum/maximum button, adjustable angle Trerice, Weiss, Weksler.

3. Digital Pressure Gauges:
Digital gauges shall have 4-1/2" stainless steel case, 0-300 psi, +/- 1% accuracy, and light powered.

L. 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

Provide stamped or engraved tags for all valves, coded to the mechanical plans. Coordinate numbering system with owner.

M. 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.

2. Coordinate necessary pipe taps and locations during the piping stage in the mechanical room.
3. All components shall be rigid mounted on a non-corrosive wall panel with shelf.
4. Route all wiring and flexible tubings outside of the cabinet in PVC conduit, properly secured to walls, pipes and equipment.

Chemical treatment contractor shall be Cascade Water Service. Coordinate with college the contact information for the specific technical/sales representative 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, fan coil units, 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 existing VAV air handling unit AH-1 to the inlet of VAV terminals 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, 1 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, 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".

The duct shall be dual wall construction where indicated, with 1" thick coated fiberglass insulation (K=.27, UL-181 rated) and a perforated metal liner.

Dual wall ductwork shall have a paint grip galvanized finish suitable for field painting.

Specified: United Sheet Metal Acoust
United Sheet Metal (single wall)
Substitute: Monroe Metal, Semco, Texas, Hamlin, Lindab, Eastern Sheetmetal, TDS, EHG, SMI Fabricators, 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

2. 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. Paintable Exterior Fiberglass Pipe Covering:

   Round ductwork shall be insulated with 1-1/2" thick, 4.0 pcf density, fiberglass insulation with all service jacket. Jacket shall be paintable, white kraft finish bonded to aluminum foil, reinforced with fiber glass yarn, and laminated to kraft paper. Insulation shall have a thermal conductivity K= 0.28 at $200^0$F (ASTM C335). Insulation shall have a perm rating of .02 (ASTM E96, A). Insulation shall be secured per manufacturer

recommendations. Joints shall be scaled vapor tight with pressure sensitive matching tape. Tape shall be approved by the insulation manufacturer. Burn characteristics shall meet 25/50 (flame/smoke) ratings per UL 723 & ASTM E84.

All butt joints shall be sealed with manufacturer's supplied tape strips with same finish cover as the insulation.

Insulate all fittings with a fiberglass insert and cover with a Zeston or Speedline one piece PVC insulated fitting cover.

Manufacturers: Owens-Corning, Johns-Manville, Knauf, Certainteed

5. Application (Duct):
   a. Unless noted otherwise, rectangular, round, and oval supply ductwork shall have exterior flexible wrap. Return duct shall not require insulation.
   b. VAV terminals: 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 (except in attic).
   c. In occupied spaces without ceilings or having partial ceilings, exposed rectangular supply ductwork shall have 1" thick, 3 PCF elastomeric foam liner.
   d. Exposed AH-1 VAV high pressure rectangular supply ductwork: Rectangular supply ductwork exposed in building or visible through open grid ceilings or ceiling panels shall be insulated with 1" thick, 3 PCF density elastomeric foam duct liner.
   e. Exposed AH-1 VAV high pressure round/oval supply ductwork: Insulate with paintable exterior fiberglass pipe covering.
   f. All transfer ducts shall have elastomeric foam liner, 1" thick x 3 PCF.
   g. Exhaust duct shall not require insulation.
   h. Flexible duct and dual wall spiral shall be factory insulated.
   h. Fresh air ductwork, including outdoor air units, kitchen makeup units, and boiler/water heater intakes, shall have exterior flexible wrap, 2" thick.
   i. Insulate flexible duct connections to air handling equipment on supply duct and outdoor air duct connections with exterior fiberglass wrap. (Flexible duct connections on return ducts to not require insulation.)

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:

- New high pressure ductwork connecting to existing VAV air handling unit AH-1

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

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, In-line Fans:
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. Submit shop drawings on all equipment listed in this section of the specifications.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.
   Provide a demonstration unit for the following equipment:
   - VAV terminals

B. 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. Unless noted otherwise, all air devices shall be all aluminum construction.

   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.

   Slot diffuser plenum boots shall be insulated with ¼" thick elastomeric foam insulation meeting UL 181 and NFPA 90A standards.

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".

Surface mount air devices shall have countersunk screw holes. Fasteners shall be flush and match the finish of the air device flange.

| Specified: | Substitute | |
|---|---|---|
| Price # | Nailor # | Kruger # |
| AMD | 6200 | 5SH |
| 620 | 51DV | 5880 |
| A-PPDR | 4360AA | 56490 (Aluminum. pan) |

C. 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. Combination Fire/Smoke Dampers: Dampers shall be rated per UL555S standard for low leakage, Class II, with pivot type blades. Damper shall be automatically actuated with a fire link ($165^0$F) and shall also have spring return, 24V electric actuator, interlocked with a smoke detector (detector provided under Div. 26 Electrical). Install dampers per manufacturer's instructions.

   Specified: Ruskin FSD36
   Substitute: Prefco, Safe-Air, National Control Air, Air Balance, Lloyd, Pottorff, Louvers and Dampers, Nailor, Greenheck. United Enertech

3. Smoke Dampers: Dampers shall be rated per UL555S standard and NFPA 90A, for low leakage, Class II, with pivot type blades. Damper shall be automatically actuated and shall also have spring return, 24V electric actuator interlocked with a smoke detector

(detector and fire alarm system relay provided under Div. 26 Electrical). Install dampers per manufacturer's instructions. Smoke dampers located in medium or high pressure duct systems shall have airfoil blades and shall be rated for 4000 FPM / 8.0"w.g.

Specified: Ruskin SD36 (or Ruskin SD-60-2 for high pressure systems)
Substitute: Prefco, Safe-Air, National Control Air, Air Balance, Lloyd, Pottorff, Louvers and Dampers, Nailor, Greenheck, United Enertech

4. 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

5. 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

6. 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.

D. Variable Air Volume Terminals (Hot Water, 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 glass fiber (1" thick elastomeric rubber, 3.0 lb./cu.ft density.) 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.

Provide factory induction sound baffle for all fan-powered terminals where noted on the equipment schedules and plans..

Plenum Inlet Filters shall be throwaway, factory mounted in the plenum inlets of the unit. Provide extra filters as indicated in the "Extra Filter" paragraph A.2.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, electrically commentated DC motor with built in inverter (ECM), with soft start, speed ramps, thermal protection and ball bearings.
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 #FDV5
Substitute: Trane #VPWF, Krueger #KQFP

E. 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, Active Aire, American Ion.

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 #ERM
Substitute: Ruskin #ELB, IAC #ELBM

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 .

   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 without written consent 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.

10. 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.

11. 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.

12. Provide a minimum of two days instruction on the system operation to the owner.

13. Actuator fail positions: Outside air dampers shall fail closed. Return air dampers shall fail open. Terminal unit hot water control valves shall fail open.

B. 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.

C. 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.

D. 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.

E. 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.

F. 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 and group toilets. Provide a heavy duty wire cover for all gymnasium and locker room sensors/thermostats.

5. Pipe temperature sensing devices shall be immersion type. Coordinate immersion well locations with mechanical contractor.

G. 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.

H. 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. Two-way Control Valves (VAV terminals):
   a. Valve shall have ANSI Class IV leakage rates
   b. Service – hot or chilled water ($0^0$ to $212^0$F)
   c. Pattern – characterized port, ball valve
   d. Body – 1" maximum size, screwed ends, 400 psi rated, forged brass. Valve body size shall be not more than two pipe sizes smaller than line size.
   e. Trim – stainless steel ball and stem, PTFE seats, EPDM 0-ring packing
   f. Operator – proportional or floating control, 100 to 1 resolution, sufficient torque to provide smooth operation and tight shut-off at pump dead head differential. Operator shall have manual release for manual positioning.
   g. Manufacturer – Belimo, Trane, Seimens, Johnson

6. 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.

7. 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.

8. 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 Siemens.

9. 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 Siemens.

10. 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

11. Campus Network and Software:
    Provide all new equipment with new application specific controller. 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.

    Coordinate any new data drop locations with owner and electrical.

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.

12. BMS Alarm Conditions:
    The BMS shall indicate, as a minimum, the following alarm conditions to the District facility management system:
    1. Low and high space temperature (each program zone)
    2. High space humidity (each humidity sensor)

13. 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) Heating control valve position
        5) Fan start/stop, status
        6) Fan Speed
        7) Primary air flow CFM, minimum, maximum, set point, adjustment
        8) Discharge temperature
        9) $CO_2$ (where indicated)
        10) Sensor plug-in jack for remote communication with a hand held computer, for trouble shooting and test and balance
        11) Ion Generator status

I. 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.

Coordinate zoning of spaces with the college. At a minimum, the new control zones shall be as follows:

1. Entrance/lobby
2. Administrative Area
2. Security

3. Admin/Advisors
4. Bookstore

Building Temperature Hold:
The existing building management system shall be modified include a building temperature hold feature for the entire building. Building temperature hold shall have an "On-Auto-Off" building 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.

J. Sequence of Operation:
1. 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 its minimum position to its 100% design flow 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):
Minimum VAV terminal primary air setting shall be reset based on space $CO_2$ level.

$CO_2$ 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.

In zones with demand-controlled ventilation, heating mode of operation shall override the minimum VAV terminal setting. If VAV terminal cannot meet heating setpoint, the VAV terminal minimum position shall modulate down as required to maintain heating setpoint.

Morning Warm-up:
During unoccupied morning warm-up, VAV terminal primary airflow shall be set to zero.

2. Bi-Polar Ion Generator:
   Provide power wiring and interlock wiring for ionization unit. Provide interlock wiring for each unit's alarm contact with the BCS. When the unit's associated fan is started, the ionization unit shall be energized.

3. Exhaust fans (Existing):
   Existing exhaust fans shall maintain their current scheduling.

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.

PRE-CONSTRUCTION TESTING:
Prior to starting the renovation work, the following systems shall be tested, for record:

1. Existing hot water pump P-2. Test unit at original design condition.

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 air volumes at each VAV terminal; for the primary air valve and the fan CFM for fan powered boxes.
      14. Furnish a schematic system diagram for each system and indicate on this sketch, the point of all pressure sensings and duct traverses.
      15. VAV air devices: Air handing system shall be balanced with the VAV air device in the fully open position, with the VAV air device branch volume damper throttled to achieve design CFM. After testing is complete, the position of the branch volume damper shall be permanently marked, then the branch damper shall be set to the fully open position.

16. Confirm operation of each needlepoint ionization module by testing ion count 5' above room floor after device (and associated VAV terminal) 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. Retest existing pump P-2 after renovation work had been completed.
2. Actual and specified pressure and temperature changes across VAV terminals.
3. Pump designation, manufacturer, impeller size, nominal H.P., voltage, amp rating.
4. Pump actual operating amps and pressure differential.
5. Flow rates for all calibrated orifice flow measuring devices and their associated set points.
6. For pumps provided with variable frequency drives or EC motors, set supply balancing valve to full open position and set maximum motor speed to achieve design flow rate. Submit motor speed.

c. 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 certified company.

END OF SECTION

# SECTION 26 01 00 - BASIC ELECTRICAL MATERIALS AND METHODS

## PART 1 - GENERAL

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### 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