Project Manual

SPARTANBURG COMMUNITY COLLEGE
Evans Building Nursing Relocation

Spartanburg, South Carolina

Architect's Project Number:	ACST240005
Project Number:	H59-6286-JM

Bid Documents Submittal

August 9, 2024

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PROJECT NUMBER: H59-6286-JM

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

AGENCY: SCC - Spartanburg Community College

PROJECT NAME: Evans Building Nursing relocation and Expansion

PROJECT NUMBER: H59-6286-JM **CONSTRUCTION COST RANGE:** $1,750,000 **to** $2,250,000

PROJECT LOCATION: Evans Building

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

Renovations to include reconfiguration of classrooms, installation of new flooring, new casework, painting, replacement of existing lighting, minor mechanical systems modifications, and permanent IT infrastructure items.

BID/SUBMITTAL DUE DATE: 10/01/2024 **TIME:** 02:00 PM **NUMBER OF COPIES:** 1

PROJECT DELIVERY METHOD: Design-Bid-Build

AGENCY PROJECT COORDINATOR: Patrick Kennedy, Project Manager

EMAIL: kennedyp@sccsc.edu **TELEPHONE:** (864) 640-1651

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

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: Goodwyn, Mills & Cawood, Inc. (GMC) **A/E CONTACT:** Gable Stubbs, AIA

EMAIL: gable.stubbs@gmcnetwork.com **TELEPHONE:** (864) 631-9101

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

PRE-BID DATE: 09/10/2024 **TIME:** 10:30 AM

PRE-BID PLACE: SCC Evans Building, Room 114, 220 East Kennedy Street, Spartanburg SC 29302

BID OPENING PLACE: SCC Ledbetter Building, Room 237, 103 Community College Drive, Spartanburg SC 29303

BID DELIVERY ADDRESSES:

HAND-DELIVERY:

Attn: SCC, ATTN: Sheri Johnson
103 Community College Drive, Ledbetter 240
Spartanburg SC 29303

MAIL SERVICE:

Attn: SCC, ATTN: Sheri Johnson, Campus Operations
131 Community College Drive
Spartanburg SC 29303

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

APPROVED BY: James R. McVay Jr. **DATE:** 08/26/2024

(OSE PROJECT MANAGER)

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

Instructions to Bidders

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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)
Spartanburg Community College
131 Community College Dr.
Spartanburg, SC 29303

Evans Building Nursing Relocation and Expansion
Project Number: H59-6286-JM

THE OWNER:
(Name, legal status, address, and other information)
Spartanburg Community College
131 Community College Dr.
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)
Goodwyn Mills Cawood, LLC
117 Welborn St.
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: Spartanburg Community College
Building Where Posted: Ledbetter Building Room 240
Address of Building: 103 Community College Drive Spartanburg, SC 29303
WEB site address (if applicable): https://www.sccsc.edu/
Posting date will be announced at Bid Opening. In addition to posting the Notice, the Owner will promptly send all responsive Bidders a copy of the Notice of Intent to Award and the final bid tabulation

§ 6.5 Protest of Solicitation or Award

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

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

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

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

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

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

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ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

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

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid.

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

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

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

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

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

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

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

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

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

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

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

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

.4 Drawings

Number	Title	Date

.5 Specifications

Section	Title	Date	Pages

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.6 Addenda:

Number	Date	Pages

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

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

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

☐ The Sustainability Plan:

☐ Supplementary and other Conditions of the Contract:

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

ARTICLE 9 Miscellaneous

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

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

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

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

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

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§ 9.2 Submitting Confidential Information

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

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

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

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

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

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

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

§ 9.3 Solicitation Information From Sources Other Than Official Source

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

§ 9.4 Builder's Risk Insurance

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

§ 9.5 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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BID BOND – AIA310 - 2010 edition

Note: AIA Document

Contractor to Provide Bid Bond In the form of AIA A310 - 2010 edition

END OF SECTION 01 10 00

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: _____

(Agency's Name)

FOR: PROJECT NAME: Evans Building Nursing Relocation

PROJECT NUMBER: H59-6286-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)*****:** Renovations to include reconfiguration of classrooms, installation of new flooring, new casework, painting, replacement of existing lighting, minor mechanical systems modifications, and permanent IT infrastructure items.

$ _____, 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			
Electrical	EL		
Heating	HT		
Plumbing	PB		
Air Conditioning	AC		
ALTERNATE #1			
ALTERNATE #2			
ALTERNATE #3			

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 **180** 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 $**250.00** 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*

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

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

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

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

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

Spartanburg Community College
131 Community College Dr.
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)

Spartanburg Community College
131 Community College Dr.
Spartanburg, SC 29303
Evans Building Nursing Relocation and Expansion
Project Number: H59-6286-JM

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

Goodwyn Mills Cawood, LLC
117 Welborn St.
Greenville, SC 29601

The Owner and Contractor agree as follows.

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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 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
N/A	

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

Item	Price
N/A	

§ 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)
N/A		

§ 4.5 Liquidated damages

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

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

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ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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

§ 5.1.3 The Owner shall make payment of the certified amount to the Contractor not later than twenty-one (21) days after receipt of the Application for Payment.

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

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

§ 5.1.6 Subject to S.C. Code Ann. § 12-8-550 (Withholding Requirements for Payments to Non-Residents), in accordance with AIA Document A201®–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

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

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

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold three and one-half percent (3.5%), as retainage, from the payment otherwise due.

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

§ 5.1.7.3 Upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7.

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

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

§ 5.2 Final Payment

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than twenty-one (21) days after the issuance of the Architect's final Certificate for Payment.

ARTICLE 6 DISPUTE RESOLUTION

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

ARTICLE 7 TERMINATION OR SUSPENSION

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

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

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

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

Name: Ethan R. Burroughs

Title: Vice President of Finance

Address: 131 Community College Dr. Spartanburg, SC 29303

Telephone: 864-592-4614

Email: burroughse@sccsc.edu

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

Name: Patrick Kennedy

Title: Project Manager

Address: 131 Community College Dr. Spartanburg, SC 29303

Telephone: 864-640-1651

Email: kennedyp@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: Gable D. Stubbs, AIA

Title: Vice President - Architecture

Address: 117 Welborn Street, Greenville, SC 29601

Telephone: (864) 527-0460

Email: gable.stubbs@gmcnetwork.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
See Index of Drawings	See Index of Drawings	7/19/2024

.6 Specifications

Section	Title	Date	Pages
See Table of Contents	See Table of Contents	7/19/2024	

.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)*
Patrick Kennedy, Project Manager	
(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)

Spartanburg Community College
131 Community College Dr.
Spartanburg, SC 29303

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.

THE OWNER:
(Name, legal status and address)

Spartanburg Community College
131 Community College Dr.
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)

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)

Spartanburg Community College
131 Community College Dr.
Spartanburg, SC 29303

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

Spartanburg Community College
131 Community College Dr.
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)

Goodwyn Mills Cawood, LLC
117 Welborn St.
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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Agency: Spartanburg Community College

Project Name: Evans Building Nursing Relocation

Project Number: H59-6286-JM

CONTRACTOR'S ONE YEAR GUARANTEE

STATE OF_____

COUNTY OF_____

We _____as General Contractor on the above-named project do hereby guarantee that all work executed under the requirements of the Contract Documents shall be free from defects due to faulty materials and/or workmanship for a period of one (1) year from date of acceptance of the work by the Owner and/or Architect/Engineer, and hereby agree to remedy defects due to faulty materials and/or workmanship, and pay for any damage resulting therefrom, at no cost to the Owner, provided however, that the following are excluded from this guarantee:

1. Defects or failures resulting from abuse by Owner.
2. Damage caused by fire, tornado, hail, hurricane, acts of God, wars, riots, or civil commotion.

_____
(Name of Contracting Firm)

*By _____

Title _____

*Must be executed by an officer of the Contracting Firm.

Sworn To before me this

_____day of _____20____ (SEAL)

_____ (STATE)

My commission expires_____

ONE YEAR GUARANTEE FORM

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: Evans Building Nursing Relocation

State Project Number: H59-6286-JM

Brief Description of Awarded Work: The intent of the project is the renovation of a portion of the first floor of the Evans Building located on the SCC Downtown Campus. The scope of the renovations is limited to include reconfiguration of existing classrooms into new lecture halls and a simulation lab; installation of new flooring finishes, new casework, painting, replacement of the existing lighting with new LED lighting, minor mechanical systems modifications, and permanent IT infrastructure items.

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

Name: Goodwyn Mills & Cawood, LLC

Address: 117 Welborn Street

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_____
(shall be no earlier than Date of Contract)

BOND NUMBER _____

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

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

SE-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: Evans Building Nursing Relocation

State Project Number: H59-6286-JM

Brief Description of Awarded Work: The intent of the project is the renovation of a portion of the first floor of the Evans Building located on the SCC Downtown Campus. The scope of the renovations is limited to include reconfiguration of existing classrooms into new lecture halls and a simulation lab; installation of new flooring finishes, new casework, painting, replacement of the existing lighting with new LED lighting, minor mechanical systems modifications, and permanent IT infrastructure items.

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

Name: Goodwyn Mills & Cawood, LLC

Address: 117 Welborn Street

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: Evans Building Nursing Relocation

PROJECT NUMBER: H59-6286-JM

CONTRACTOR: _____

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

ADJUSTMENTS IN THE CONTRACT SUM:

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

ADJUSTMENTS IN THE CONTRACT TIME:

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

AGENCY ACCEPTANCE AND CERTIFICATION:

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

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

Print Name of Representative:_____

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

APPROVED BY:_____ **DATE:** _____
(OSE Project Manager)

SUBMIT THE FOLLOWING TO OSE

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

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

CHANGE ORDER REQUEST SUMMARY – DESIGN-BID-BUILD

AGENCY: Spartanburg Community College

PROJECT NAME: Evans Building Nursing Relocation

PROJECT NUMBER: H59-6286-JM

CONTRACTOR: _____

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

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

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

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

CONTRACTOR ACCEPTANCE:

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

Print Name of Representative:_____

A/E RECOMMENDATION FOR ACCEPTANCE:

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

Print Name of Representative:_____

AGENCY ACCEPTANCE:

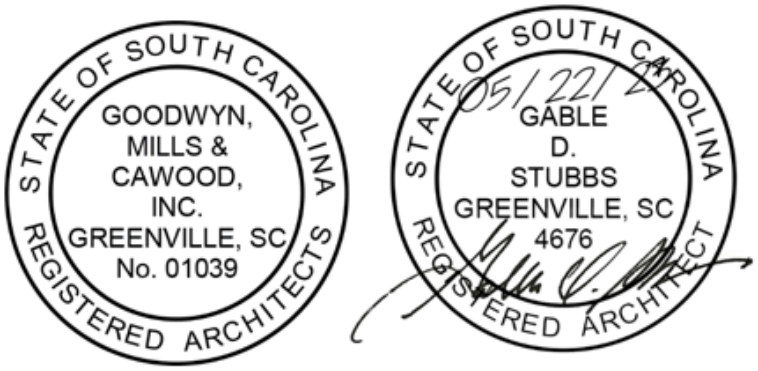
BY:_____ **Date:**_____
(Signature of Representative)

Print Name of Representative:_____

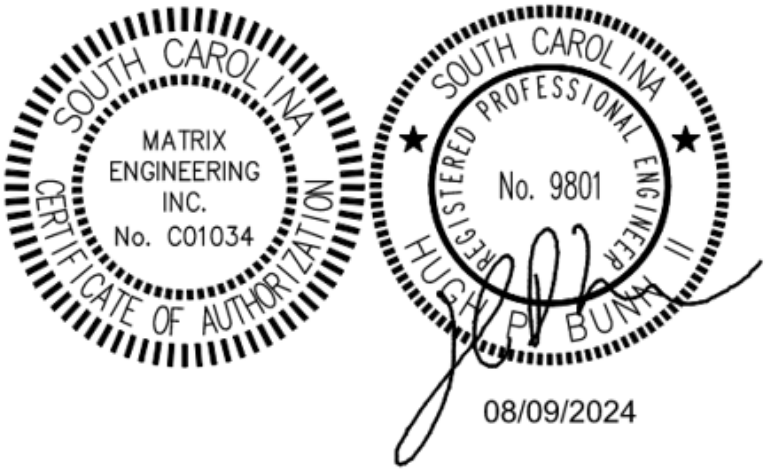
Instruction to Contractor: Attach documentation as needed to justify the requested change to the contract and submit to A/E or Agency.

SECTION 00 10 07 – SEALS PAGE

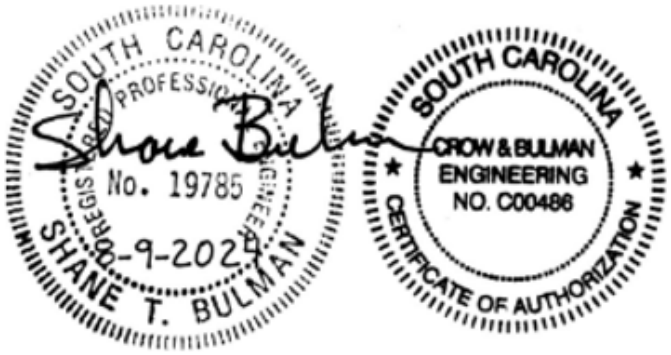
ARCHITECTURAL



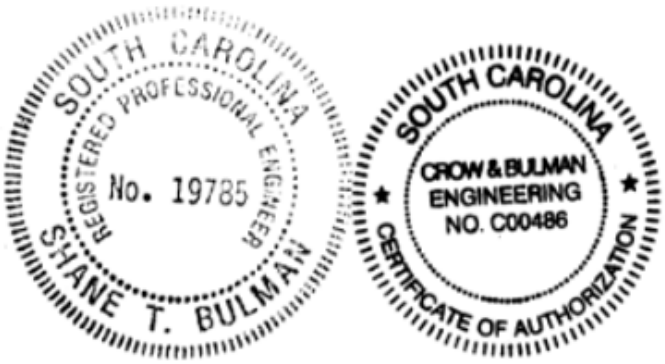
ELECTRICAL



PLUMBING



MECHANICAL



END OF DOCUMENT 00 10 07

SECTION 00 65 14 – CERTIFICATION OF NON-USE OF ASBESTOS CONTAINING PRODUCTS

PROJECT NAME **Evans Building Nursing Relocation**
PROJECT # **H59-6286-JM**
CITY **SPARTANBURG**

STATE **SOUTH CAROLINA**

Date _____

Project _____

Address _____

_____

_____

I hereby certify that to the best of my knowledge the projects and materials incorporated into the above referenced project are free of asbestos and asbestos-containing materials

Company _____
(name of firm or corporation making certification)

Represented By _____
(person authorized to sign)

Title _____
(owner/partner/president/vice president)

Address _____

_____

_____

License No. _____

Federal ID No. _____

Attest:

By _____

Title _____

END OF DOCUMENT 00 65 14

SECTION 00 65 36 – CONTRACTOR'S GENERAL WARRANTY/CERTIFICATION

PROJECT NAME: **Evans Building Nursing Relocation**

LOCATION: **Spartanburg, South Carolina**

The undersigned Contractor hereby warrants, in accordance with the applicable provisions and terms set forth in the Contract Documents, all materials and workmanship incorporated in the project for Spartanburg Community College in **Spartanburg, South Carolina**, against any and all defects due to faulty materials or workmanship or negligence for a period of 12 months, or such longer periods as set form in the Contract Documents, from the effective date of this warranty. This Contractor further warrants all work incorporated in this project to remain leakproof and watertight at all points for a period of 24 months from the effective date of this Warranty.

This Warranty shall be binding where defects occur due to normal usage conditions and does not cover willful or malicious damage, damage caused by acts of God or other casualty beyond the control of the Contractor.

This Warranty shall be in addition to other warranties or guarantees set form in the Contract Documents, and shall not act to constitute a waiver of additional protection of the Owner afforded, where applicable, by consumer protection and product liability provisions of law, and these stipulations shall not constitute waiver of any additional rights or remedies available to the Owner under the law.

Signed: _____

Name: _____

Title: _____

Date: _____

(Corporate seal)

Subscribed and sworn before me this

_____ Day of_____, 20___.

_____

(Notary Public)

END OF DOCUMENT 00 65 36

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

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

B. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Evans Building Nursing Relocation
Spartanburg Community College
131 Community College Dr.
Spartanburg, SC 29303

1. Architect’s Project #: ACST240005
2. State Project #: H59-6286-JM

B. Owner: Spartanburg Community College

1. Representative: Patrick Kennedy
Project Manager
131 Community College Dr. Spartanburg, SC 29303
864-640-1651
kennedyp@sccsc.edu

C. Architect: Goodwyn Mills & Cawood
117 Welborn St.
Greenville, SC 29601
864-527-0460

1. Representative: Gable Stubbs, AIA
   Vice President – Architecture
   864-527-0460
   gable.stubbs@gmcnetwork.com

   Summary of the work covered by the contract:
   a. The intent of the project is the renovation of a portion of the first floor of the Evans Building located on the SCC Downtown Campus. The scope of the renovations is limited to include reconfiguration of existing classrooms into new lecture halls and a simulation lab; installation of new flooring finishes, new casework, painting, replacement of the existing lighting with new LED lighting, minor mechanical systems modifications, and permanent IT infrastructure items.

1.4 WORK PHASES

A. The Work shall be conducted in a single phase.

1.5 WORK UNDER OTHER CONTRACTS

A. General: The project is to be conducted under a single-prime General Contractor based upon the complete Bid Package. The owner will / may contract with other contractors to perform specialty items and or construction. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

1. Other Contracts performed by the Owner may include:
   a. Lecture Hall 1 and 2 Furniture
   b. Interior Glass Partition
   c. Data Wiring and Termination
      1) Conduit, pathways, cable tray, and junction boxes are included in the scope of this project and shall be performed by the GC of this bid package.
   d. Technology equipment including server racks, servers, TVs, etc.
      1) Conduit, pathways, cable tray, and junction boxes are included in the scope of this project and shall be performed by the GC of this bid package
   e. Security Equipment including card readers and cameras
      1) Conduit, pathways, cable tray, junction boxes, and balance of door hardware are included in the scope of this project and shall be performed by the GC of this bid package
   f. Other items as specifically noted to be Owner Furnished Owner Installed (OFOI)

1.6 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated.

1. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.

2. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.

1.7 USE OF PREMISES

A. General: Contractor shall have unlimited use of premises for construction operations as indicated on Drawings by the Contract limits to architectural site plan.

1. Areas of the building outside the area of work **WILL** be occupied during construction. It is the responsibility of the Contractor to provide the necessary provisions to maintain a safe and secure construction site including the following:
   a. Provide perimeter secure barrier protection for adjacent spaces.
   b. Notify the Owner and the Architect of changes to the site security as the work progresses. Changes in the site organization are permitted as work in areas is completed and access to other areas becomes necessary. Provide a minimum of seven (7) day advanced notice to the Owner / Architect prior to making changes to the site organization and safety / security provisions.

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

1. Owner Occupancy: Allow for Owner occupancy of Project site for work contracted separately.

2. Driveways 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.
   a. Schedule deliveries to minimize use of driveways and entrances.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Use of Existing Building: Maintain existing adjacent building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.
1. The contractor may **NOT** use the existing premise for any other purpose than the construction of the work as described in the documents. Do not interact with the Campus Occupants, other than those designated in these Documents or as designated by the Owner.

1.8 OWNER'S OCCUPANCY REQUIREMENTS

A. Owner Occupancy: Owner will occupy a portion of the existing building during most of the construction period. Cooperate with Owner during construction operations to minimize conflicts and adjacent facility usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.

1. Noisy and/or disruptive work may be performed during normal working hours. Notify the Owner of any work that is excessively noisy or disruptive.

B. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in the completed building, at the time of Substantial Completion, provided such occupancy does not interfere with Final Completion of the Work. Such placement of equipment shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for the completed work before Owner occupancy.

2. A Certificate of Occupancy / Use will be prepared by the Architect / Agency and shall be issued by the local Authority having Jurisdiction (OSE) prior to any Owner occupancy.

3. Before Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.

4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

1.9 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed inside the existing building during normal business working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, except otherwise indicated.

1. Weekend Hours: As agreed during the preconstruction meeting.

2. Early Morning Hours: As agreed during the preconstruction meeting.

3. Hours for Utility Shutdowns: Seven (7) days prior written notice and Owner prior approval required.

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

1. Notify Owner in writing not less than seven (7) days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Owner's written permission.

1.10 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI/CSC's "MasterFormat" numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.

2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

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

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall

be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
   a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 25 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Sections include the following:

1. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within 7 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.4 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Contractor will issue a Change Order for signatures of Owner and Contractor on SE-380 Change Order to Design-Bid-Build Contract.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive that instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
a. If the change in the contract sum cannot be determined prior to the start of the work or if a delay in starting of the work would cause other delays to the project schedule, the Contractor shall perform the work described in the Change Directive and the Owner / Architect & Contractor will agree to the cost of the change after the work is complete.

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 DEFINITIONS

A. 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.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

    a. Application for Payment forms with Continuation Sheets.
    b. Submittals Schedule.

2. Submit the Schedule of Values to Architect within ten (10) days of the full execution of the Agreement..

3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

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

1. Identification: Include the following Project identification on the Schedule of Values:

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

2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

3. 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.
5. 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.
6. Provide a separate line item for closeout documents. Value must be greater than or equal to .5% of the contract value.
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.
    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
8. 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.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

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

1. Submit Draft Pay Application no later than the 25th of the Month for review by the Owner and Architect.
2. The Invoice Date shall be the last day of the month.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Transmittal: Submit 4 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

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

E. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor’s waiver of mechanic’s lien for construction period covered by the application.

a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

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

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule.
4. Schedule of unit prices.
5. Submittals Schedule.
6. List of Contractor's staff assignments.
7. Copies of building permits.
8. Certificates of insurance and insurance policies.
9. Performance and payment bonds.

G. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
3. AIA Document G707, "Consent of Surety to Final Payment."
4. Evidence that claims have been settled.
5. Transmittal of required Project construction records to the Owner.
6. Proof that taxes, fees, and similar obligations were paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish, and similar elements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. General project coordination procedures.
2. Coordination Drawings.
3. Administrative and supervisory personnel.
4. Project meetings.
5. Requests for Interpretation (RFIs).

1.2 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

   a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
   b. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.
   c. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Key Personnel Names: Within 7 calendar days of starting construction operations, submit a list of principle staff assignments, including Field Superintendent and Project Manager for the Project to the owner for approval.

1. Submittal Form: As noted in the Series 0 Bidding Requirements and Contract Forms.
2. Provide all contact information including home and mobile phone numbers.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Attend a preconstruction conference scheduled by the Owner before starting construction.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    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. Quality control requirements.
    l. Preparation of Record Documents.
    m. Use of the premises.
    n. Responsibility for temporary facilities and controls.
    o. Parking availability.
    p. Office, work, and storage areas.
    q. Equipment deliveries and priorities.
    r. First aid.
    s. Security.
    t. Progress cleaning.
    u. Working hours.

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

D. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.

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

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

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) RFI status.
        5) Field report issues requiring action.
        6) Deliveries.
        7) Progress cleaning.
        8) Quality and work standards.
        9) Status of Change Orders.

2. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

E. Coordination Meetings: Conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1.7 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.

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

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

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

C. Hard-Copy RFIs: Format to be provided by Contractor and approved by Architect.

1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

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

1. The following RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for coordination information already indicated in the Contract Documents.
d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of Architect's actions on submittals.
f. Incomplete RFIs or RFIs with numerous errors.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.

3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures."

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

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

G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at each Project Meeting. The Submittal log shall include not less than the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Daily construction reports.
5. Field condition reports.
6. Special reports.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting the Schedule of Values.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.3 SUBMITTALS

A. Qualification Data: For scheduling consultant.

B. Submittals Schedule: Submit four copies of schedule. Arrange the following information in a tabular format:
1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

C. Preliminary Construction Schedule: Submit four opaque copies.
1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.

D. Preliminary Network Diagram: Submit two opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.

E. Contractor's Construction Schedule: Submit four opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.

F. CPM Reports: Concurrent with CPM schedule, submit one copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

G. Daily Construction Reports: Submit four copies at monthly intervals.

H. Field Condition Reports: Submit four copies at time of discovery of differing conditions.

I. Special Reports: Submit four copies at time of unusual event.

1.4 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
4. Review schedule for work of Owner's separate contracts.
5. Review time required for review of submittals and resubmittals.
6. Review requirements for tests and inspections by independent testing and inspecting agencies.
7. Review time required for completion and startup procedures.
8. Review and finalize list of construction activities to be included in schedule.
9. Review submittal requirements and procedures.
10. Review procedures for updating schedule.

1.5 PERFORMANCE MONITORING

A. Owner may elect throughout, or at any time during, the Project to record the number of workers and construction equipment working on each construction schedule activity in each area of the Project. Owner's request for this information will be without additional cost to the project and shall be provided within five workdays of receipt of the Owner's written request. This information will be used by the Owner to evaluate the adequacy of the Contractor's performance and project manpower staffing, as well as any Contractor claims.

B. The Contractor is required to attend all construction coordination meetings. As such, the Contractor shall prepare a three-week rolling bar chart one week behind the date of the meeting depicting work completed, and three weeks look-ahead. The bar chart should be sorted by Area by Total Float. Information to be shown on the bar chart includes: Activity ID, Activity Description, Original Duration, Remaining Duration, Percent Complete, Area Code, Responsibility Code, Early Start/Actual Start, Early Finish, and Total Float.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

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

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with preliminary network diagram. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
    a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Within 15 work days of Notice to Proceed, submit a Preliminary Schedule detailing planned work/operations for the first 90 calendar days of the Project with sufficient detail to allow progress payments to be made from the Preliminary Schedule while the Baseline Schedule is being developed and approved, and summary level activities representing major components of work included in the Contract for the balance of the Project performance period through to the Substantial Completion Date. All activities shown in the Preliminary Schedule shall be cost loaded, including the summary level activities.

B. The Preliminary Schedule shall be updated on a monthly basis and shall be consistent with the procedures and requirements described for Baseline Schedule.

C. Within 10 workdays of receipt by the Owner of the Preliminary Schedule, the Contractor and the Owner shall meet to discuss the results of Owner’s schedule review. To the extent that revisions are required, the Contractor shall resubmit the Preliminary Schedule to Owner for approval within five workdays of receipt of Owner’s comments.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.

a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.

3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

4. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

   a. Preparation and processing of submittals.
   b. Mobilization and demobilization.
   c. Purchase of materials.
   d. Delivery.
   e. Fabrication.
   f. Utility interruptions.
   g. Installation.
   h. Work by Owner that may affect or be affected by Contractor's activities.
   i. Testing and commissioning.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.

3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

   a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.

2. Description of activity.

3. Principal events of activity.

4. Immediately preceding and succeeding activities.

5. Early and late start dates.

6. Early and late finish dates.

7. Activity duration in workdays.

8. Total float or slack time.

9. Average size of workforce.

10. Dollar value of activity (coordinated with the Schedule of Values).

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.

2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

    a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
    b. Submit value summary printouts one week before each regularly scheduled progress meeting.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.

15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial Completions and occupancies.
19. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Scheduling Representative: Engage a qualified scheduling representative to provide planning, evaluation, and reporting using CPM scheduling.

1. Within five work days after the date of Notice to proceed, designate in writing an authorized scheduler or scheduling representative in the Contractor’s organization who shall be responsible for coordinating with the Owner during the preparation and maintenance of the Project Schedule.
2. Meetings: Scheduling representative shall attend all meetings related to Project progress, alleged delays, and time impact.

B. Distribution: Distribute copies of approved schedule to Architect and Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

3.2 RESPONSIBILITY FOR COMPLETION

A. If, in the owner's opinion, the Contractor falls behind the planned progress as noted by negative float shown on the current monthly Schedule Update, the Contractor shall take any and all steps necessary to improve its progress at no additional cost to the Project. This shall not be construed as prohibiting the contractor from increasing the number of working hours, shifts per day, working days per week, or the amount of construction equipment, or any combination of the foregoing, to eliminate the delay in the scheduled progress.

B. Failure of the contractor to comply with the Owner's requirements above shall be grounds for determination by owner that the contractor is not prosecuting the work with such diligence as will ensure completion within the contract time. Upon such determination, Owner may recommend termination of the Contractor's right to proceed with the work, or any separable part thereof, in accordance with the applicable provision of the Contract Documents.

3.3 PAYMENTS TO CONTRACTOR

A. Owner shall review the Contractor's monthly request for payment upon receipt and shall process the request for payment based upon the current approved Schedule Update within the time frame specified in the Contract Documents. Owner will consider the Contractor's overall progress toward Project Completion along with the progress for discrete activities to determine the amount to be approved for the monthly payment request.

END OF SECTION 01 32 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. See Division 1 Section “Construction Progress Documentation” for submitting schedules and reports, including Contractor’s Construction Schedule and Submittals Schedule.

C. See Division 1 Section “Quality Requirements” for submitting test and inspection reports.

D. See Division 1 Section “Closeout Procedures” for submitting warranties.

E. See Division 1 Section “Project Record Documents” for submitting Record Drawings, Record Specifications, and Record Product Data.

F. See Division 1 Section “Operation and maintenance Data” for submitting operation and maintenance manuals.

G. See Division 1 Section “Demonstration and Training” for submitting videotapes of demonstration of equipment and training of owner’s personnel.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 QUALITY ASSURANCE

A. General: Prepare and submit Submittals required by individual Specification Sections.

1. Submittals shall be neat and legible, of uniform scale, responsive to requirements, with all sheets of similar information of same size.

2. Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect for Contractor’s use in preparing submittals, upon approval of the Electronic Data Transfer Form.

3. Facsimile copies will not be reviewed or accepted. No exceptions.

B. Resident Engineer Copies: Submit one copy of approved shop drawings prior to installing any equipment in the Project.

1.4 SUBMITTAL PROCEDURES

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

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. 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.

B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.

1. Initial Review: Architect will review submittals with reasonable promptness as to cause no delay in the Work.

2. Unless otherwise agreed to in the preconstruction conference, allow at least 14 working days in the construction schedule for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

D. The Architect will review the submittals on shop drawings, product data and samples and one (1) resubmittal.

1. For submittals in excess of the one (1) resubmittal, the Contractor shall reimburse the Owner, for additional services required of the Architect, and the Architect’s consultant by these additional resubmittals.

2. No time will be allowed the Contractor for delays caused by excess number of resubmittals.

E. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.

2. Provide a space approximately 4 by 5 inches (102 by 127 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.

F. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.

1. Include Contractor’s certification stating that information submitted complies with requirements of the Contract Documents.

I. 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.

J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:

1. Contractor’s acceptance of Electronic Data in any form shall constitute acceptance of Terms and Conditions of this Section, including payment of indicated fees.

2. Electronic Data includes but is not limited to, computer-aided design (CAD) files including native file formats (DWG) and drawing exchange formats (DXF), and files produced by word processing, spread sheet, scheduling, data base and other software programs. The Electronic Data may be provided in an original format produced by Architect or an alternate, “translated” format as requested by other parties to this Agreement.

3. The means by which the Electronic Data is transferred may include but are not limited to, electronic mail, File Transfer Protocol (FTP) sites, project websites, and disk copies transmitted between the parties to this Agreement. Contractor acknowledges that Electronic Data transferred in any manner or translated from the system and format used by Architect to an alternate system or format is subject to errors that may affect the accuracy and reliability of the data and that the data may be altered, whether inadvertently or otherwise. Accordingly, Architect makes no warranty, express or implied, as to the accuracy of the information transferred. The Electronic Data are not the Construction Documents and differences may exist between these electronic files and corresponding hard-copy Construction Documents. Architect reserves the right to retain hard copy originals in addition to electronic copies of the Electronic Data transferred, which originals shall be referred to and shall govern.

4. The Electronic Data provided by Architect under the terms of this Agreement are the proprietary information of Architect. All Electronic Data shall be treated as confidential and shall not be disclosed to or shared with others without Architect’s express, written consent.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Digital Submittals: Submit PDF file of each submittal, unless otherwise indicated. PDF shall include a letter of transmittal and contractor’s stamp denoting review and approval. List all components included in the submittal and list items required, but excluded from current submittal to be provided separately.

2. Number of Copies: For non-electronic submittals, submit three copies of each submittal, unless otherwise indicated. Architect will return three copies. Mark up and retain one returned copy as a Project Record Document.

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

1. If information must be specially prepared for submittal because standard printed 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:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Manufacturer's catalog cuts.
e. Wiring diagrams showing factory-installed wiring.
f. Printed performance curves.
g. Operational range diagrams.
h. Compliance with recognized trade association standards.
i. Compliance with recognized testing agency standards.

C. 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.

1. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).

D. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Division 1 Section “Quality Requirements” for mockups.

2. 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.

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

4. 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.

E. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

F. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."

G. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit one copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized 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.
3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section "Quality Requirements."

B. Testing and Inspection Reports: Comply with requirements in Division 1 Section “Quality Requirements.”

C. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."

D. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

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

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

G. Installer Certificates: Prepare 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.

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

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

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

K. Material Test Reports: Prepare 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.

L. Product Test Reports: Prepare written reports indicating 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.

M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

N. Preconstruction Test Reports: Prepare 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: Prepare 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: Prepare reports written by a qualified testing agency, on testing agency's standard form, 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. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."

R. Design Data: Prepare 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.

S. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

2.3 DELEGATED DESIGN

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

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

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

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

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. 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.

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

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. General: Architect will not review partial submittals for a specific product or scope at work. Each submittal shall be complete with all pertinent and applicable information necessary to review.

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

D. 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.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 33 00

SECTION 01 33 00.01 - REQUEST FOR ELECTRONIC DRAWING FILES

PROJECT: Evans Building Nursing Relocation
Spartanburg Community College
Architect's Project No. ACST240005

Data contained in electronic files are part of GMC's instruments of service and shall not be used for any purpose other than a bid or submittal document for the above referenced project. The use of electronic files, either all or in-part, for other than its initial use for bidding or submittal document shall be full and sufficient cause to hold GMC and/or their consultants (as author of the electronic files) harmless against any claim or liability resulting from any discrepancy, error or omission in the file's original or altered form. Furthermore, the recipient of electronic files, to the fullest extent permitted by law, indemnify and hold GMC harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from your use of these electronic files.

Because information presented on the electronic files can be modified, unintentionally or otherwise, GMC reserves the right to remove all indications of ownership and/or involvement from each electronic display.

The transfer of the data or any copy of the data, in any form to a third party without the prior written consent of GMC shall not be permitted.

Under no circumstances shall delivery of the electronic files for use by the recipient be deemed a sale by GMC, and GMC makes no warranties (either express or implied) of merchantability and fitness for any particular purpose. In no event shall GMC be liable for any loss of profit or any consequential damages as a result of the use or reuse of the electronic files.

Signing this letter indicates your agreement to the terms stated above and that you have the authority to bind your firm with respect to the terms stated above.

Accepted and Agreed by	
Printed Name	**Company**
Title	**Date**
Signature	

Sheets Requested	
Sheet No.	**Sheet Title**

SECTION 01 35 16 - ALTERATION PROJECT PROCEDURES

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 special procedures for alteration work.

1.3 DEFINITIONS

A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.

B. Consolidate: To strengthen loose or deteriorated materials in place.

C. Design Reference Sample: A sample that represents the Architect's pre-bid selection of work to be matched; it may be existing work or work specially produced for the Project.

D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

K. Retain: To keep existing items that are not to be removed or dismantled.

L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.4 PROJECT MEETINGS FOR ALTERATION WORK

A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.

1. Attendees: In addition to representatives of Owner, Architect, and Contractor, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.

2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:

   a. Alteration Work Sub-schedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Fire-prevention plan.
   c. Governing regulations.
   d. Areas where existing construction is to remain and the required protection.
   e. Hauling routes.
   f. Sequence of alteration work operations.
   g. Storage, protection, and accounting for salvaged and specially fabricated items.
   h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
   i. Qualifications of personnel assigned to alteration work and assigned duties.
   j. Requirements for extent and quality of work, tolerances, and required clearances.
   k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.

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

B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at weekly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Architect and Contractor, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.

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

   a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
   b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:

1) Interface requirements of alteration work with other Project Work.
2) Status of submittals for alteration work.
3) Access to alteration work locations.
4) Effectiveness of fire-prevention plan.
5) Quality and work standards of alteration work.
6) Change Orders for alteration work.

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

1.5 REPAIR / SALVAGED MATERIALS

A. Review all salvageable materials with the owner prior to removal from the site. The owner reserves the right to keep any and all materials noted to be demolished whether intended for reinstallation in the project or intended to be discarded. Inventory all materials and include an assessment of condition for review by the owner prior to removal from the site.

1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to Owner where directed at Project site.

2. Salvage and retain the existing exterior brick. The brick is to be refurbished for use on the project.

3. Salvage and retain the existing exterior metal wall panel and trim.

B. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1.6 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials:

1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.

2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area off-site.

5. Protect items from damage during transport and storage.

B. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.

2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.

D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.

1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.

2. Secure stored materials to protect from theft.

3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F (3 deg C) or more above the dew point.

E. Storage Space:

1. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.

1.7 FIELD CONDITIONS

A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs.

B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.

1. Use only proven protection methods, appropriate to each area and surface being protected.

2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.

3. Erect temporary barriers to form and maintain fire-egress routes.

4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.

B. Temporary Protection of Materials to Remain:

1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. Existing Roofing: Prior to the start of work in an area, install roofing protection.

1. Prepare roofing for removal and new roofing at the appropriate time so as to not expose the building interior to prolonged exposure to the elements.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."

2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.

    a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
    a. Train each fire watch in the proper operation of fire-control equipment and alarms.
    b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
    c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
    d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
    e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.

C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

A. Have specialty work performed only by qualified specialists.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs.

D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 01 35 16

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control, including special inspections and structural testing performed during the progress of the Work.

1. A Certificate of Occupancy cannot be issued without documentation that these inspections have been performed and the Work is in conformance with the Contract Documents.

2. Refer to the Schedule of Required Special Inspections at the end of this Section.

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

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. See Divisions 2 through 15 Sections, and drawings, for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

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

C. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

D. 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 industry standards.

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

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

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

H. 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.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

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

1.3 CONFLICTING REQUIREMENTS

A. General: 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 uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1. Conflicting requirements or information in the documents shall be submitted to the Architect as an RFI for review and response.

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

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.

6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. 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.

1.5 QUALITY ASSURANCE

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

B. 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.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. 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 to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.

G. 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.

1.6 QUALITY CONTROL

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

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be borne by the Contractor.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. 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.

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

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

2. 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.

6. Owner shall be given the opportunity to witness all testing.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

D. 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. The cost for retesting due to failed inspections or testing will be the responsibility of the Contractor.

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

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

2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.

3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

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

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

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

1.7 SPECIAL TESTS AND INSPECTIONS

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

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

B. Schedule of Special Inspections: Refer to Structural Drawings for complete list of required special inspections.

1. Comply with **Seismic Design Category "C"** as noted in the Geotechnical Report.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

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

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

3.2 REPAIR AND PROTECTION

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

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

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

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

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

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

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; (Formerly: ACI International); www.abma.com.
9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
11. AF&PA - American Forest & Paper Association; www.afandpa.org.
12. AGA - American Gas Association; www.aga.org.
13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
15. AI - Asphalt Institute; www.asphaltinstitute.org.
16. AIA - American Institute of Architects (The); www.aia.org.
17. AISC - American Institute of Steel Construction; www.aisc.org.
18. AISI - American Iron and Steel Institute; www.steel.org.
19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
21. ANSI - American National Standards Institute; www.ansi.org.
22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
23. APA - APA - The Engineered Wood Association; www.apawood.org.
24. APA - Architectural Precast Association; www.archprecast.org.
25. API - American Petroleum Institute; www.api.org.
26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
27. ARI - American Refrigeration Institute; (See AHRI).
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.

32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; (See ECIA).
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
73. ECIA - Electronic Components Industry Association; www.eciaonline.org.
74. EIA - Electronic Industries Alliance; (See TIA).
75. EIMA - EIFS Industry Members Association; www.eima.com.
76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
77. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
78. ESTA - Entertainment Services and Technology Association; (See PLASA).
79. EVO - Efficiency Valuation Organization; www.evo-world.org.
80. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.

81. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
82. FM Approvals - FM Approvals LLC; www.fmglobal.com.
83. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
84. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.
85. FSA - Fluid Sealing Association; www.fluidsealing.com.
86. FSC - Forest Stewardship Council U.S.; www.fscus.org.
87. GA - Gypsum Association; www.gypsum.org.
88. GANA - Glass Association of North America; www.glasswebsite.com.
89. GS - Green Seal; www.greenseal.org.
90. HI - Hydraulic Institute; www.pumps.org.
91. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
92. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
93. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
94. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
95. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
96. IAS - International Accreditation Service; www.iasonline.org.
97. IAS - International Approval Services; (See CSA).
98. ICBO - International Conference of Building Officials; (See ICC).
99. ICC - International Code Council; www.iccsafe.org.
100. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
101. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
102. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
103. IEC - International Electrotechnical Commission; http://www.iec.ch.
104. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
105. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
106. IESNA - Illuminating Engineering Society of North America; (See IES).
107. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
108. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
109. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
110. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
111. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
112. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
113. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
114. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
115. ISO - International Organization for Standardization; www.iso.org.
116. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
117. ITU - International Telecommunication Union; www.itu.int/home.
118. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
119. LMA - Laminating Materials Association; (See CPA).
120. LPI - Lightning Protection Institute; www.lightning.org.
121. MBMA - Metal Building Manufacturers Association; www.mbma.com.
122. MCA - Metal Construction Association; www.metalconstruction.org.
123. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
124. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
125. MHIA - Material Handling Industry of America; www.mhia.org.
126. MIA - Marble Institute of America; www.marble-institute.com.
127. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
128. MPI - Master Painters Institute; www.paintinfo.com.

129. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
130. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
131. NACE - (National Association of Corrosion Engineers International); www.nace.org.
132. NADCA - National Air Duct Cleaners Association; www.nadca.com.
133. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
134. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
135. NBI - New Buildings Institute; www.newbuildings.org.
136. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
137. NCMA - National Concrete Masonry Association; www.ncma.org.
138. NEBB - National Environmental Balancing Bureau; www.nebb.org.
139. NECA - National Electrical Contractors Association; www.necanet.org.
140. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
141. NEMA - National Electrical Manufacturers Association; www.nema.org.
142. NETA - InterNational Electrical Testing Association; www.netaworld.org.
143. NFHS - National Federation of State High School Associations; www.nfhs.org.
144. NFPA - National Fire Protection Association; www.nfpa.org.
145. NFPA - NFPA International; (See NFPA).
146. NFRC - National Fenestration Rating Council; www.nfrc.org.
147. NHLA - National Hardwood Lumber Association; www.nhla.com.
148. NLGA - National Lumber Grades Authority; www.nlga.org.
149. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
150. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
151. NRCA - National Roofing Contractors Association; www.nrca.net.
152. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
153. NSF - NSF International; www.nsf.org.
154. NSPE - National Society of Professional Engineers; www.nspe.org.
155. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
156. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
157. NWFA - National Wood Flooring Association; www.nwfa.org.
158. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
159. PDI - Plumbing & Drainage Institute; www.pdionline.org.
160. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
161. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
162. RFCI - Resilient Floor Covering Institute; www.rfci.com.
163. RIS - Redwood Inspection Service; www.redwoodinspection.com.
164. SAE - SAE International; www.sae.org.
165. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
166. SDI - Steel Deck Institute; www.sdi.org.
167. SDI - Steel Door Institute; www.steeldoor.org.
168. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
169. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
170. SIA - Security Industry Association; www.siaonline.org.
171. SJI - Steel Joist Institute; www.steeljoist.org.
172. SMA - Screen Manufacturers Association; www.smainfo.org.
173. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
174. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
175. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
176. SPIB - Southern Pine Inspection Bureau; www.spib.org.
177. SPRI - Single Ply Roofing Industry; www.spri.org.
178. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
179. SSINA - Specialty Steel Industry of North America; www.ssina.com.

180. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
181. STI - Steel Tank Institute; www.steeltank.com.
182. SWI - Steel Window Institute; www.steelwindows.com.
183. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
184. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
185. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
186. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
187. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
188. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance
189. TMS - The Masonry Society; www.masonrysociety.org.
190. TPI - Truss Plate Institute; www.tpinst.org.
191. TPI - Turfgrass Producers International; www.turfgrasssod.org.
192. TRI - Tile Roofing Institute; www.tileroofing.org.
193. UL - Underwriters Laboratories Inc.; www.ul.com.
194. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
195. USAV - USA Volleyball; www.usavolleyball.org.
196. USGBC - U.S. Green Building Council; www.usgbc.org.
197. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
198. WASTEC - Waste Equipment Technology Association; www.wastec.org.
199. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
200. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
201. WDMA - Window & Door Manufacturers Association; www.wdma.com.
202. WI - Woodwork Institute; www.wicnet.org.
203. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
204. WWPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; www.quicksearch.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov/fdsys.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.

13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeial Convention; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
   a. Available from Defense Standardization Program; www.dsp.dla.mil.
   b. Available from General Services Administration; www.gsa.gov.
   c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
3. CDHS; California Department of Health Services; (See CDPH).
4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservice.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

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

B. See Division 1 Section "Execution Requirements" for progress cleaning requirements.

1.2 DEFINITIONS

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

1.3 USE CHARGES

A. Water Service: Use water from owner’s existing water system without metering and without payment of use charges.

B. Electric Power Service: Use electric power from owner’s existing system without metering and without payment of use charges.

1.4 SUBMITTALS

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

1. Indicate temporary construction fence location, material, and height and location of temporary Job Trailer (if provided).

1.5 PROJECT CONDITIONS

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

1. The contractor is permitted to use the existing services within the existing facility during construction and at no cost to the contractor or project.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 EQUIPMENT

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

B. Drinking-Water Fixtures: Drinking-water fountains, containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.

C. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

D. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

E. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

F. Temporary Job Trailer: The Contractor may use the existing building as the temporary job trailer. At Substantial Completion, restore these facilities to condition existing before initial use or incorporated area into final construction.

G. Temporary Toilet Fixtures: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

PART 3 - EXECUTION

3.1 TEMPORARY UTILITY INSTALLATION

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

B. Temporary Job Trailer: Use of the existing Building as the Temporary Job Trailer is permitted, as long as the spaces are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

1. Utilize rooms and spaces for the temporary Job Trailer as designated or agreed upon with the Owner.

C. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

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

1. Toilets: Use of Owner's existing toilet facilities shall **NOT** be permitted.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

G. Temporary HVAC Systems: The General Contractor shall be responsible for providing temporary heating in building areas until current Project Schedule indicates the start of the acoustical panel ceilings, carpeting, and other finishes requiring special environmental conditions.

1. Select a safe equipment that will not have a harmful effect on completed installations or elements being installed.

2. The Mechanical, Electrical, Plumbing, and General Contractors must include in their construction schedules provisions for electrical power, natural gas service, water, sewer and storm drainage utilities to be fully functional and available to enable the HVAC systems to be operated as required to facilitate the installation of the Finishes Work.

3. The Mechanical Contractor shall assume responsibility for providing heating and cooling after the current Project Schedule indicates the start of the Finishes Work.

4. The permanent systems in the various building areas shall not be started until doors and exterior windows, or suitable temporary construction is in place and the building is relatively dust free. At a minimum, the floors shall be broom clean, drywall finishing and paint spraying completed.

5. If in the Architect’s sole opinion conditions exist sufficient to compromise the quality of the HVAC system at the date of Owner acceptance, the authorization to startup the permanent system shall be postponed until such time as the unsatisfactory conditions are corrected.

6. The additional cost to maintain the operation of the temporary heating and cooling shall be apportioned by the Architect, to the Contractors whose Work is deficient at the time. Systems shall operate sufficiently to maintain the minimum design temperature and relative humidity within 15 percent.

7. The Warranty on all HVAC equipment will be extended from start-up to one year past the date of Substantial Completion and paid for by the Mechanical Contractor. The Mechanical Contractor, sub-contractors, and manufacturers may in lieu of providing a manufacturer’s extended warranty, provide a service/replacement contract to extend the normal one year warranty period to a minimum of one year beyond the date of acceptance of the building by the Owner. Extended warranties such as five year compressor warranties shall be extended beyond the period established by the actual start-up date of the equipment as defined herin.

H. Electric Power Service: Use of Owner’s existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

I. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

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

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

1. Provide additional telephone lines for the following:

a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.

2. At each telephone, post a list of important telephone numbers including police and fire departments, Contractor's home office, Architect's office, Owner's office, and Principal subcontractors' field and home offices.

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

L. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities.

3.2 SUPPORT FACILITIES INSTALLATION

A. Traffic Control: The Owner will strictly enforce posted speed limits and driving regulations. The Owner reserves the right to take any action deemed appropriate regarding violations including, but not limited to, refusal to permit violators to enter upon or remain on the premises.

1. Escort appropriately to and from the site all large crawler or mobile cranes operating on site and take all precautions necessary to prevent damage to Owner's property during operation both on and off site.

2. Obtain advance written authorization from Owner and local Government Authorities for all road blocks, detours and other interruptions of normal traffic flow that may be needed to facilitate construction operations.

B. Parking:

1. Contractor will be provided access to on-Campus parking during construction only in areas designated or agreed to by the owner. Site parking is limited and will not be permitted in staff parking areas. The contractor is responsible for making any off-site parking provisions when required.

C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.

D. Janitorial Services: Provide janitorial services on a daily basis for temporary offices, first=aid stations, toilets, wash facilities, lunchrooms, and similar areas.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Construction Site Security: Provide maintenance and cleaning of entire construction site on a daily basis. Secure all construction equipment, machinery and vehicles, park and store only within fenced area, and render inoperable during non-work hours. Contractor is responsible to ensure that no construction materials, tools, equipment, machinery or vehicles can be sued for unauthorized entry or other damage or interference to activities and security of existing facilities adjacent to and in the vicinity of construction site.

B. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed provide lighting, including flashing red or amber lights.

C. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

3.4 OPERATION, TERMINATION, AND REMOVAL

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

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Except for using permanent fire protections as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

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

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project:

1. Product delivery, storage, and handling.
2. Manufacturers' standard warranties on products.
3. Special warranties.
4. Product substitutions.
5. Comparable products.

B. See Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.

1.2 DEFINITIONS

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

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

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

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.3 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

B. Product substitutions will only be considered if requested in writing 10 days prior to the date for receipt of bids.

1. Substitution Request Form: Use CSI Form 13.1A.

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

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If approved, Architect will issue an addendum to the bidding documents.

a. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

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

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

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

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

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. Comply with product manufacturer’s written instructions for temperature, humidity, ventilation, and weather=protection requirements for storage.

7. Protect stored products from damage.

B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner’s construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

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

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

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

2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

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

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures:

1. Product: Where Specification paragraphs or subparagraphs titled “Product” name a single product and manufacturer, provide the product named.
2. Products: Where Specification paragraphs or subparagraphs titled “Products” introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
3. Manufacturers: Where Specification paragraphs or subparagraphs titled “Manufacturers” introduce a list of manufacturers’ names, provide a product by one of the manufacturers listed that complies with requirements.
4. Available Products: Where Specification paragraphs or subparagraphs titled “Available Products” introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product. Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
5. Available Manufacturers: Where Specification paragraphs or subparagraphs titled “Available Manufacturers” introduce a list of manufacturers’ names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.
6. Product Options: Where Specification paragraphs titled “Product Options” indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product

or system by another manufacturer. Comply with provisions in “Product Substitutions” Article.

7. Basis-of-Design Product: Where Specification paragraphs or subparagraphs titled “Basis-of-Design Product” are included and also introduce or refer to a list of manufacturers’ names, provide either the specified 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 provisions in “Comparable Products” Article to obtain approval for use of an unnamed product or manufacturer.

8. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.

    a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on “substitutions” for selection of a matching product.

9. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

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

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

2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.

5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

1. General installation of products.
2. Progress cleaning.
3. Starting and adjusting.
4. Protection of installed construction.
5. Correction of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Conditions: 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

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

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 INSTALLATION

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

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

C. 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.

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

E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.

F. 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.

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

3.4 PROGRESS CLEANING

A. General: Clean Project work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).

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

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

1. Remove liquid spills promptly.

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

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.

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

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

F. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

G. 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.

H. 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.

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

3.5 STARTING AND ADJUSTING

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

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

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

3.6 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.

3.7 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 73 10 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. See Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

1.3 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. 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.

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

1.4 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials 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 match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. 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.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

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

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

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

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. 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.
5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 73 10

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. See Division 1 Section “Payment Procedures” for requirements for Applications for Payment for Substantial and Final Completion.

C. See Division 1 Section “Project Record Documents” for submitting Record Drawings, Record Specifications, and Record Product Data.

D. See Division 1 Section “Operation and Maintenance Data” for operation and maintenance manual requirements.

E. See Division 1 Section “Demonstration and Training” for requirements for instructing Owner’s personnel.

F. See Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
4. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
7. Complete startup testing of systems.
8. Submit test/adjust/balance records.
9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
10. Advise Owner of changeover in heat and other utilities.
11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

12. Complete final cleaning requirements, including touchup painting.
13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. 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.

C. The Architect will make one (1) inspection at Substantial Completion at the Architect's cost.

1. For inspections in excess of the one (1), the Contractor shall reimburse the Owner, for additional services required of the Architect and the Architect's consultants for these additional inspections.
2. The Architect will repeat inspection when requested and assured that the Work has been substantially completed.
3. Results of the completed inspection will form the basis of requirements for final acceptance.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
2. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
3. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
5. Submit pest-control final inspection report and warranty.
6. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.

B. Inspection: Submit a written request for final inspection for 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.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. For inspections in excess of the one (1), the Contractor shall reimburse the Owner for additional services required of the Architect and the Architect's consultants for these additional inspections.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.5 WARRANTIES

A. Submittal Time: 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.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, in areas disturbed by construction activities, including, of rubbish, waste material, litter, and other foreign substances.
b. Remove tools, construction equipment, machinery, and surplus material from Project site.
c. Clean exposed 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.
d. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
e. 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.
f. Remove labels that are not permanent.
g. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
h. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
i. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
j. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
k. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
l. Pressure was existing building and surfaces.
m. Refinish, strip and wax existing VCT in all work areas and existing corridors.
n. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

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

END OF SECTION 01 77 00

SECTION 01 78 10 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. See Division 1 Section “Operation and Maintenance Data” for operation and maintenance manual requirements.

C. See Divisions 2 through 16 Sections for specific requirements for project Record Documents of the Work in those Sections.

1.2 SUBMITTALS

A. Record Drawings: Submit one set of marked-up Record Prints.

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one copy of each Product Data submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.

b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Drawings: Organize into unbound sets matching Record Prints. Place drawings in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.

2. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. 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.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

1. The Owner and Architect will periodically review record documents to assure compliance with this requirement.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 01 78 10

SECTION 01 78 20 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Emergency manuals.
2. Operation manuals for systems, subsystems, and equipment.
3. Maintenance manuals for the care and maintenance of products, materials, finishes, and systems and equipment.

B. See Divisions 2 through 16 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 SUBMITTALS

A. Submission of Operating and Maintenance Manuals: When the HVAC systems are approximately 75 percent complete, submit four sets of manuals for Architect’s review.

1. Architect will submit one copy with review comments to the Owner for approval.

B. Initial Submittal: Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.

C. Final Submittal:

1. Correct or modify each manual to comply with Architect's comments. Provide one electronic copy of the final manual on CDROM or Flash Drive in Adobe PDF format. Provide PDF bookmarks for each section and subsection of the manual. Submit corrected manual within 15 days of receipt of Architect's comments.

1.3 COORDINATION

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

B. Purge manuals prior to submitting to Architect to include only technical data related to in-place construction.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. 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.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. 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 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    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.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.

4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

A. 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.

B. 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.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.

4. Material and chemical composition.

5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. 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.

B. 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.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment.

D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions, and demonstration and training videotape if available, that detail essential maintenance procedures.

E. 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.

F. 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.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. 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.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. 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.

E. 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.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.

G. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 20

SECTION 01 80 00 - SITE CLEAN UP AND POST-PROJECT SUBMITTALS

PART 1 - GENERAL

1.1 DAMAGE REPAIR

A. Any damage to surfaces and/or building components, other than those designated for demolition, caused by the Contractor's activity or his workers, shall be repaired or replaced at no additional cost to the Owner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 FINAL CONSTRUCTION SITE CLEAN UP

A. Work of this section shall be performed once the Contractor has successfully passed all required final visual inspections and final air clearance testing of the regulated areas, and all asbestos-containing waste has been properly removed from the work site.

B. Prior to Owner's Representative's final inspection, the Contractor shall remove from within and around the building all debris, waste, trash, etc., generated by the Contractor's workers.

3.2 FINAL INSPECTION

A. The Owner's Representative shall set a date for the final inspection when a notice of readiness for final inspection is received from the Contractor. During this inspection the Owner's Representative shall make a written list of deficiencies.

B. When all deficient items have been corrected and accepted by the Owner's Representative, the Contractor may submit his application for payment.

3.3 POST-SUBMITTAL DOCUMENTS AND REQUEST FOR PAYMENT

A. Four (4) copies of the following documents shall be submitted to the Owner:

1. Copy of a South Carolina DHEC notification for demolition and/or renovation dates when removal will begin and be completed.
2. Proof of insurance naming the Owner, Architect and Consultant as additional certificate holder.
3. Copy of State of South Carolina Asbestos Contractor's license.
4. Copy of State of South Carolina asbestos license of the general supervisor(s) involved in the project.
5. Proof of asbestos worker training for each employee involved in the project.

6. Medical examination report for each employee of the Contractor who was involved in the project.
7. Respirator training for each employee of the Contractor who was involved in the project.
8. "Worker Release Form" for each employee of the Contractor who was involved in the project.
9. Material Safety Data Sheets for all hazardous chemicals incorporated in the work.
10. Regulated area sign in/sign out sheets and daily logs maintained by the Contractor's asbestos abatement supervisor.
11. Certificate of Visual Inspection for each regulated area signed by the Contractor and a representative of the Owner.
12. Waste Shipment Records and Chain of Custody Forms for asbestos waste.

B. Post-submittals shall be bound in three-ring binders with each section tabbed or separated by a colored sheet of paper and cross-referenced to an index. The cover shall be labeled with the project name and inclusive dates. Four (4) copies of the post-submittals shall be forwarded to the Architect at the following address within 10 days of project completion:

Goodwyn, Mills & Cawood, LLC.
117 Welborn St.
Greenville, SC 29601
ATTN: Mr. Gable Stubbs

END OF SECTION 01 80 00

SECTION 01 82 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training.

B. See Divisions 2 through 16 Sections for specific requirements for demonstration and training for products in those Sections.

1.2 SUBMITTALS

A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including 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.

B. Demonstration and Training: Submit four copies within seven days of end of each training module.

1.3 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 1 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Preinstruction Conference: Conduct conference at Project site. Review methods and procedures related to demonstration and training.

D. 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.

1.4 COORDINATION

A. Coordinate instruction schedule with Owner's operations, and provide a minimum of seven (7) days notice prior to any instruction.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:

1. Laboratory equipment and fume hoods.
2. Motorized window shade systems.
3. Fire-protection systems, including fire alarm and fire-extinguishing systems.
4. HVAC systems, including air-handling equipment, air distribution systems, and terminal equipment and devices.
5. HVAC instrumentation and controls.
6. Electrical service and distribution, including transformers, switchboards, panelboards, uninterruptible power supplies, and motor controls.
7. Packaged engine generators, including transfer switches.
8. Lighting equipment and controls.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:

1. Basis of System Design, Operational Requirements, and Criteria: Include system and equipment descriptions, operating standards, regulatory requirements, equipment function, operating characteristics, limiting conditions, and performance curves.
2. Documentation: Review emergency, operations, and maintenance manuals; Project Record Documents; identification systems; warranties and bonds; and maintenance service agreements.
3. Emergencies: Include instructions on stopping; shutdown instructions; operating instructions for conditions outside normal operating limits; instructions on meaning of warnings trouble indications, and error messages; and required sequences for electric or electronic systems.
4. Operations: Include startup, break-in, control, and safety procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; operating procedures for emergencies and equipment failure; and required sequences for electric or electronic systems.
5. Adjustments: Include alignments and checking, noise, vibration, economy, and efficiency adjustments.
6. Troubleshooting: Include diagnostic instructions and test and inspection procedures.

7. Maintenance: Include inspection procedures, types of cleaning agents, methods of cleaning, procedures for preventive and routine maintenance, and instruction on use of special tools.

8. Repairs: Include diagnosis, repair, and disassembly instructions; instructions for identifying parts; and review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Owner will furnish an instructor to describe Owner's operational philosophy.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Architect, with at least 14 days' advance notice.

D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral performance-based test.

3.2 DEMONSTRATION AND TRAINING VIDEOTAPES

A. General: Engage a qualified commercial photographer to record demonstration and training videotapes. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Recording Format: Provide digital CD/DVD or flash drive color recording.

C. Narration: Describe scenes by audio narration by microphone while recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

END OF SECTION 01 82 00

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 01 10 00 "Summary" for restrictions on use of the premises and Owner-occupancy requirements.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

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

1.4 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.

3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

1.6 CLOSEOUT SUBMITTALS

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

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. 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.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.

c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.3 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.

3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

4. Cover and protect furniture, furnishings, and equipment that have not been removed.

5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."

B. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
8. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. 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 small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

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.

3.8 SELECTIVE DEMOLITION SCHEDULE

A. See Drawings.

END OF SECTION 02 41 19

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel railings.

1.2 COORDINATION

A. Coordinate installation of anchorages for railings. Furnish setting templates and directions for installing anchorages, including sleeves, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data: For each type product.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Delegated Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For delegated design professional engineer.

B. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails:
    a. Uniform load of 50 lbf/ ft. applied in any direction.
    b. Concentrated load of 200 lbf applied in any direction.
    c. Uniform and concentrated loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A500/A500M (cold formed).

C. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

D. Cast Iron Fittings: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.

2.4 FASTENERS

A. Fastener Materials:

1. Ungalvanized-Steel Railing Components: Plated steel fasteners complying with ASTM F1941/F1941M, Class Fe/Zn 5 for zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193**.**

1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Cast iron center of handrail 2-1/2 inches from wall.

B. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

C. Shop Primers: Provide primers that comply with Section 09 91 23 "Interior Painting."

D. Finish Coats: Provide products that comply with Section 09 91 23 "Interior Painting."

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

C. Form work true to line and level with accurate angles and surfaces.

D. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

E. Form changes in direction as follows:

1. As detailed.
2. By bending to smallest radius that will not result in distortion of railing member.

F. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

G. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

2.7 STEEL AND IRON FINISHES

A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3.

C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1 for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Shop prime uncoated railings with primers specified in Section 09 91 23 "Interior Painting" unless indicated.

D. Shop-Painted Finish: Comply with Section 09 91 23 "Interior Painting."

1. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.

3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

B. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 ATTACHING RAILINGS

A. Attach handrails to walls with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

B. Secure wall brackets to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.
4. For steel-framed partitions, fasten brackets directly to steel framing or concealed steel reinforcements, using self-tapping screws of size and type required to support structural loads.
5. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.4 REPAIR

A. Touchup Painting:

1. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 23 "Interior Painting."

3.5 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 52 13

SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood blocking.
2. Plywood panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. 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 D5664.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Fire-retardant-treated wood.
3. Power-driven fasteners.
4. Post-installed anchors.

1.4 QUALITY ASSURANCE

A. 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.

1.5 DELIVERY, STORAGE, AND HANDLING

A. 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

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all miscellaneous carpentry unless otherwise indicated. items indicated on Drawings, and the following:

1. Blocking and similar concealed members in contact with masonry or concrete.
2. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment shall not promote corrosion of metal fasteners.

2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat all miscellaneous carpentry unless otherwise indicated. items indicated on Drawings, and the following:

2.4 DIMENSION LUMBER FRAMING

A. Other Framing: No. 2 grade of the following species:

1. Southern pine; SPIB.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species. any of the following species: the following species:

1. Mixed southern pine or southern pine; SPIB.

C. 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.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.6 PLYWOOD PANELS

A. Platform Panels: Plywood, DOC PS 1, Exterior, A-C in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

B. Nails, Brads, and Staples: ASTM F1667.

C. Screws for Fastening to Metal Framing: ASTM C1002 ASTM C954, length as recommended by screw manufacturer for material being fastened.

D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 ICC-ES AC58andICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.

2.8 METAL FRAMING ANCHORS

A. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

B. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

1. Use for wood-preservative-treated lumber and where indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Install plywood panels by fastening to framing.

D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Do not splice structural members between supports unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

G. 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.

H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

I. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

J. 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 INSTALLATION OF WOOD BLOCKING

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

END OF SECTION 06 10 53

SECTION 06 2023 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior trim.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Interior trim.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation.

1. Protect materials from weather by covering with waterproof sheeting, securely anchored.
2. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet-work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2.2 INTERIOR TRIM

A. Lumber Trim for Opaque Finish (Painted Finish):

1. Species and Grade: S4S Poplar Select.
2. Maximum Moisture Content for Hardwoods: 8 percent.
3. Finger Jointing: Not allowed.
4. Face Surface: Surfaced (smooth).

2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

2.4 FABRICATION

A. Back out or kerf backs of the following members, except those with ends exposed in finished work:

1. Interior trim.

B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
3. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
4. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 INSTALLATION OF INTERIOR TRIM

A. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available.

1. Do not use pieces less than 24 inches long, except where necessary.
2. Stagger joints in adjacent and related standing and running trim.
3. Cope at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint.
4. Use scarf joints for end-to-end joints.
5. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
6. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting.
7. Fasten to prevent movement or warping.
8. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements.

1. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

B. Adjust joinery for uniform appearance.

3.6 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces.

B. Restore damaged or soiled areas and touch up factory-applied finishes if any.

3.7 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 2023

SECTION 06 41 16 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad architectural cabinets.
2. Solid surfacing countertops.
3. Cabinet hardware and accessories.
4. Countertop brackets.
5. Miscellaneous materials.

B. Related Requirements:

1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.

1.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type product.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.

C. Samples for Verification: For the following:

1. Laminates: 8 by 10 inches, for each type, color, pattern, and surface finish required.
    a. Provide one sample applied to core material with specified edge material applied to one edge.
2. Thermally Fused Laminate (TFL) Panels: 8 by 10 inches, for each color, pattern, and surface finish.
    a. Provide edge banding on one edge.
3. Exposed Cabinet Hardware and Accessories: One full-size unit for each type and finish.
4. Solid Surfacing Material: 6 inches square.
5. Bracket: Architect-approved sample to be returned to Contractor for use.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.

B. Product Certificates: For each type of product.

C. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For plastic laminate and solid surfacing 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.

1.7 QUALITY ASSURANCE

A. Manufacturer's Qualifications: 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.

B. Installer Qualifications: Manufacturer of products.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.9 FIELD CONDITIONS

A. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 degrees and 90 degrees F and relative humidity between 43 percent and 70 percent during the remainder of the construction period.

B. 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/concealed by construction, and indicate measurements on shop drawings.

1.10 WARRANTY

A. Solid Surface:

1. Manufacturer's Warranty: Manufacturer and installer agree to repair or replace sheet material not free from defects in materials, fabrication, or workmanship within specified warranty period.

a. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

B. Architectural Woodwork Standards Grade:

1. Aesthetics Grade: Custom.

2. Performance: Level 4.

C. Type of Construction: Frameless.

D. Door and Drawer-Front Style: Flush overlay.

E. Laminate:

1. High-Pressure Decorative Laminate – PL-1: ISO 4586-3, grades as indicated or if not indicated, as required by quality standard.

a. Basis-of-Design Product: Subject to compliance with requirements, provide Formica Corporation (www.formica.com, 800-367-6422); products or comparable products by one of the following:

1) Laminart LLC.

2) Pionite; a Panolam Industries International, Inc. brand.

3) Wilsonart LLC

2. Plastic Laminate – PL-2: grades as indicated or if not indicated, as required by quality standard.

    a. Basis-of-Design Product: Subject to compliance with requirements, provide Formica Corporation (www.fenixforinteriors-na.com, 800-367-6222); FENIX NTM, Standard Core, or comparable product, approved by the Architect.

F. Exposed Surfaces:

1. Plastic-Laminate Grade: JL and HGS.
2. Edges: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
3. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.

G. Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: Thermally fused laminate panels.
    a. Edges of Plastic-Laminate Shelves: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
    b. Edges of Thermally Fused Laminate Panel Shelves: PVC or polyester edge banding.
    c. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, ISO 4586-3, grade to match exposed surface.
2. Drawer Sides and Backs: Thermally fused laminate panels with PVC or polyester edge banding.
3. Drawer Bottoms: Hardwood plywood.

H. Dust Panels: 1/4-inch plywood or tempered hardboard above compartments and drawers unless located directly under tops.

I. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, ISO 4583-3, grade to match exposed surface.

J. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints as required to meet performance requirement.

K. Colors, Patterns, and Finishes: See Finish Legend on Drawings.

2.2 SOLID SURFACING COUNTERTOP MATERIALS – SS-1

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ISFA 2-01.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Wilsonart LLC; product or comparable product by one of the following:
    a. DuPont; DuPont de Nemours, Inc.
    b. Formica Corporation.
2. Thickness: 1/2 inch.
3. Type: Provide Standard type.

4. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    a. Flame-Spread Index: 25 or less.
    b. Smoke-Developed Index: 50 less.
5. Colors and Patterns: See Finish Legend on Drawings.

2.3 SOLID SURFACING COUNTERTOP MATERIALS – SS-2

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ISFA 2-01.
    1. Basis-of-Design Product: Subject to compliance with requirements, provide DuPont; DuPont de Nemours, Inc.; Corian or comparable product by one of the following:
        a. Formica Corporation.
        b. Wilsonart LLC.
    2. Thickness: 3/4 inch.
    3. Type: Provide Standard type.
    4. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
        a. Flame-Spread Index: 25 or less.
        b. Smoke-Developed Index: 50 or less.
    5. Colors and Patterns: See Finish Legend on Drawings.

2.4 WOOD MATERIAL

A. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
    1. Particleboard (Medium Density): ANSI A208.1, Grade M-2.
    2. Softwood Plywood: DOC PS 1
    3. Thermally Fused Laminate (TFL) Panels: Particleboard finished with thermally fused, melamine-impregnated decorative paper.

2.5 CABINET HARDWARE AND ACCESSORIES

A. Cabinet Hardware: Provide cabinet hardware and accessory materials associated with architectural cabinets.

B. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 100 degrees of opening , self-closing.

C. Wire Pulls: Back mounted, solid metal , 4 inches long, 5/16 inch in diameter.

D. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.

E. Shelf Rests: ANSI/BHMA A156.9, B04013; metal.

F. Drawer Slides: ANSI/BHMA A156.9.

1. Standard Duty (Grade 1 and Grade 2): Side mount.
2. Heavy-Duty (Grade 1HD-100 and Grade 1HD-200): Side mount.
    a. Type: Full overtravel extension.
    b. Material: Galvanized steel ball bearing slides.
    c. Motion Feature: Push to open and soft close dampener.

G. Door Locks: ANSI/BHMA A156.11, E07121.

H. Drawer Locks: ANSI/BHMA A156.11, E07041.

I. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.

J. Grommets for Cable Passage: 2-inch outside diameter, molded-plastic grommets and matching plastic caps with slot for wire passage.

1. Color: Black.
2. Locations: As directed by Architect and coordinated with Owner.

K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.

1. Satin Stainless Steel: ANSI/BHMA 630.

L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.6 COUNTERTOP BRACKETS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Rangine Corporation (www.rakks.com, 800-826-6006); products, or comparable product, approved by the Architect.

B. Counter Support Brackets:

1. Product: EH Countertop Support Bracket, Rakks EH-1824.
2. Description: Wall mounted, heavy duty, welded aluminum brackets for supporting countertops.
    a. Material: Extruded aluminum complying with ASTM B221, 6063-T5 alloy and temper.
    b. Dimensions: T-profile 2 by 2 inches; 18 inches by 24 inches as indicated on Drawings.
    c. Finish: Factory mill finish; field primed and painted.
    d. Color: As selected by Architect.

C. Vanity Support Bracket:

1. Product: ADA-Compliant Vanity Support Bracket, Rakks EH-LV-80.

2. Description: Wall mounted, heavy duty, welded aluminum brackets for supporting countertops.

a. Material: Extruded aluminum complying with ASTM B221, 6063-T5 alloy and temper.

b. Dimensions: T-profile 2 by 2 inches; 18 inches by 21-1/2 inches, as indicated on Drawings.

c. Finish: Factory mill finish; field primed and painted.

d. Color: As selected by Architect.

2.7 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. 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.

C. Adhesive for Bonding Plastic Laminate: Type II water-resistant type as selected by fabricator to comply with requirements.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

D. Sealant: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."

2.8 FABRICATION - CABINETS

A. Fabricate architectural cabinets to dimensions, profiles, and details indicated.

B. 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 architectural cabinet fabrication will be complete.

C. 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.

2.9 FABRICATION – SOLID SURFACING COUNTERTOPS

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. Countertops: Solid surface material with front edge built up with same material.

C. Backsplashes: Solid surface material.

D. 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.

E. Joints: Fabricate countertops without joints.

F. 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.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets and countertops to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION - CABINETS

A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.

B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.

1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

2. Install cabinets without distortion so doors and drawers fit openings 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.

3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches on center with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

3.3 INSTALLATION – COUNTERTOP BRACKETS

A. Install countertop brackets in accordance with manufacturer's written installation instructions and approved shop drawings.

3.4 INSTALLATION – SOLID-SURFACING COUNTERTOPS

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 subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

C. 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.

D. 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.

E. 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.

F. 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.

G. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

3.5 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets and countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean exposed and semiexposed surfaces.

END OF SECTION 06 41 16

SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes sealants and joint backing.

1.2 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product including:

1. Preparation instructions and recommendations.
2. Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.
3. Data for sealants required in each fire resistance rated assembly.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint sealant application, joint location, and designation.
2. Joint sealant manufacturer and product name.
3. Joint sealant formulation.
4. Joint sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: Submit qualification data for qualified applicator.

B. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

C. Warranty: Sample of unexecuted manufacturer and installer special warranties.

D. Preconstruction Compatibility and Adhesion Test Reports: From manufacturer. Include written interpretation of reports and recommendations for primers and substrate preparation.

E. Preconstruction field-adhesion test reports.

1. Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing.

F. Field quality control adhesion test reports.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Provide joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.

B. Installer Qualifications: Company with minimum of three years experience specializing in work of this section, employing applicators trained for application of joint sealants required for this project, with record of successful completion of projects of similar scope, and approved by manufacturer.

C. Preconstruction Manufacturer Laboratory Compatibility, Staining, and Adhesion Testing: Submit samples of each substrate or adjacent material that will be in contact with or affect joint sealants. Current manufacturer test data of products on matching substrates will be acceptable.

1. Adhesion: Use ASTM C719 and ASTM C94 to determine requirements for joint preparation, including cleaning and priming.
2. Compatibility: Use ASTM C1087 to determine materials forming joints and adjacent materials do not adversely affect sealant materials and do not affect sealant color.
3. Stain Testing: Use ASTM C510, ASTM C1248, or ASTM D2203 to verify non-staining characteristics of proposed sealants on specified substrates.
4. Pre-construction manufacturer laboratory testing is not required when sealant manufacturer can furnish data acceptable to Architect based on previous testing for materials matching those of the Work.

D. Preconstruction Field-Adhesion Testing: Prior to installing joint sealants, field test adhesion to joint substrates using ASTM C1193 Method A. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written test report.

1.5 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in manufacturer's unopened original packaging.

B. Store primers and sealants in dry location with ambient temperature range of 60 degrees to 80 degrees F.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install primers or sealants when atmospheric temperatures or joint surface temperatures are less than 40 degrees. F.

1.7 SCHEDULING

A. Ensure sealants are cured before covering with other materials.

1.8 COORDINATION

A. Coordinate installation of joint sealants with cleaning of joint sealant substrates and other operations that may impact installation or finished joint sealant work.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that demonstrate deterioration or adhesive or cohesive failure under normal use within warranty period specified.

1. Silicone (Mildew) Sealants: 5 years from date of Substantial Completion

B. Installer's Warranty: Original statement on Installer's letterhead in which Installer agrees to repair or replace joint sealants that demonstrate deterioration or failure within warranty period specified.

1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis-of-Design Product: Subject to compliance with requirements, provide Tremco, Inc., Commercial Sealants and Waterproofing Division, An RPM Company; products indicated or comparable products or one of the following:

1. Pecora Corporation.
2. Sika Corporation

2.2 MATERIALS - GENERAL

A. Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with adjacent materials, as demonstrated by sealant manufacturer using ASTM C1087 testing and related experience.

B. Joint Sealant Standard: Comply with ASTM C920 and other specified requirements for each joint sealant.

C. Stain Test Characteristics: Where sealants are required to be nonstaining, provide sealants tested per ASTM C1248 as non-staining on porous joint substrates specified.

2.3 SILICONE JOINT SEALANTS

A. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Basis of Design Product: Tremsil 200 Sanitary.
2. Applications: Use for restroom and bathrooms.
3. Color: White and clear.

2.4 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Basis of Design Product: Tremflex 834.
2. Applications: Use for typical interior applications, such as walls, floors and ceilings, and as an acoustical sealant.
3. Color: White, paintable.

2.5 JOINT SEALANT ACCESSORIES

A. Cylindrical Sealant Backing: ASTM C1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.

B. Bond Breaker Tape: Polymer tape compatible with joint sealant and adjacent materials and recommended by sealant manufacturer.

C. Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.

D. Cleaners: Chemical cleaners acceptable to joint sealant manufacturer.

E. Masking Tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joint profiles and surfaces to determine if work is ready to receive joint sealants.

1. Verify joint dimensions are adequate for development of sealant movement capability.
2. Verify joint surfaces are clean, dry, and adequately cured.

B. Proceed with joint sealant work once conditions meet sealant manufacturer's written recommendations.

3.2 PREPARATION

A. Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer. Comply with ASTM C1193.

1. Remove curing compounds, laitance, form-release agents, dust, and other contaminants.
2. Clean nonporous and porous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.
3. Protect elements surrounding Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

3.3 SEALANT APPLICATION

A. Sealant and Primer Installation Standard: Comply with ASTM C1193 and manufacturer's written instructions.

B. Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.

1. Install joint backing to maintain the following joint ratios:

a. Joints up to 1/2 inchwide: 1:1 width to depth ratio.

b. Joints greater than 1/2 inchwide: 2:1 width to depth ratio; maximum 1/2-inch joint depth.

2. Install bond breaker tape over substrates when sealant backings are not used.

C. Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.

D. Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.

E. Liquid Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.

1. Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.

2. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

3. Tool exposed joint surface concave using tooling agents approved by sealant manufacturer for application.

F. Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.

1. Remove masking tape immediately after tooling joint without disturbing seal.

2. Remove excess sealant from surfaces while still uncured.

G. Installation of Acoustical Sealant: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations on both sides of assemblies with a continuous bead of acoustical sealant. Comply with ASTM C919 and with manufacturer's written recommendations.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer’s instructions and with ASTM C1193, Method A.

1. Perform 5 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate, and one test for each 1000 feet of joint length thereafter or 1 test per each floor per building elevation, minimum.

2. For sealant applied between dissimilar materials, test both sides of joint.

B. Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.

C. Submit report of field adhesion testing to Architect indicating tests, locations, dates, results, and remedial actions taken.

END OF SECTION 07 92 00

SECTION 08 12 13 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior standard steel frames.
2. Borrowed lites.

B. Related Requirements:

1. Section 08 71 00 "Door Hardware" for door hardware.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data:

1. Interior standard steel frames.

B. Shop Drawings: Include the following:

1. Elevations of each frame type.
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.

C. Product Schedule: For hollow-metal frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 HOLLOW METAL FRAMES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door; AADG, Inc.; ASSA ABLOY.
2. Curries, AADG, Inc.; ASSA ABLOY Group.
3. Republic Doors and Frames; a Allegion brand.
4. Steelcraft; Allegion plc.

2.2 STANDARD STEEL FRAMES

A. Construct hollow-metal frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Interior Standard Steel Frames: SDI A250.8.

1. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
2. Construction: Face welded.
3. Exposed Finish: Prime.

2.3 BORROWED LITES

A. Fabricate of uncoated steel sheet, minimum thickness of 0.053 inch.

B. Construction: Face welded.

C. Fabricate in one piece except where handling and shipping limitations require multiple sections.

D. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

2.5 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.

C. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

D. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

2.6 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2. Door Silencers: Drill stops to receive door silencers as follows. Keep holes clear during construction.

   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

B. Hardware Preparation: Factory prepare hollow-metal frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule on Drawings, and templates.

1. Reinforce frames to receive nontemplated, mortised, and surface-mounted door hardware.

2. Comply with BHMA A156.115 for preparing hollow-metal frames for hardware.

C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with mitered hairline joints.

1. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches on center and not more than 2 inches on center from each corner.

2.7 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. General: Install hollow-metal frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions. Comply with SDI A250.11.

B. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

1. Install frames with removable stops located on secure side of opening.

C. Floor Anchors: Secure with postinstalled expansion anchors.

1. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

D. Solidly pack mineral-fiber insulation inside frames.

E. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

F. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

3.3 CLEANING AND TOUCHUP

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 08 12 13

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core five-ply flush wood veneer-faced doors for transparent finish.
2. Light frames.

B. Related Requirements:

1. Section 08 80 00 "Glazing" for glass view panels in flush wood doors.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type product, including the following:

1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Door trim for openings.
5. Door frame construction.
6. Factory-machining criteria.
7. Factory- finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

1. Door schedule indicating door and frame location, type, size and swing.
2. Door elevations, dimension and locations of hardware, lite cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Dimensions and locations of blocking for hardware attachment.
5. Dimensions and locations of mortises and holes for hardware.
6. Clearances and undercuts.
7. Doors to be factory finished and application requirements.

C. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For door inspector.

1. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.
2. Submit copy of DHI's Fire and Egress Door Assembly Inspector (FDAI) certificate.

B. Field quality-control reports.

C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Special warranties.

1.6 QUALITY ASSURANCE

A. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies complies with qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:

1. DHI's Fire and Egress Door Assembly Inspector (FDAI) certification.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in cardboard cartons, and wrap bundles of doors in plastic sheeting.

C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.8 FIELD CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 degrees and 90 degrees F and relative humidity between 43 and 70 percent during remainder of construction period.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Delamination of veneer.
    b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
    c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
2. Warranty also includes installation and finishing that may be required due to repair or replacement of defective doors
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain flush wood doors from single manufacturer from a single source.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with ANSI/WDMA I.S. 1A.

2.3 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Doors, Solid-Core Five-Ply Veneer-Faced:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Lambton Doors.
    b. Masonite Architectural.
    c. Oshkosh Door Company.
    d. VT Industries, Inc.
2. Performance Grade: ANSI/WDMA I.S. 1A Heavy Duty.
3. ANSI/WDMA I.S. 1A Quality Grade: Custom.
4. Faces: Single-ply wood veneer not less than 1/50 inch thick.
    a. Species: Match existing.
    b. Cut: Match existing.
    c. Match between Veneer Leaves: Match existing.

d. Assembly of Veneer Leaves on Door Faces: Match existing.

5. Exposed Vertical and Top Edges: Same species as faces - Architectural Woodwork Standards edge Type A.

6. Core for Non-Fire-Rated Doors:

   a. Either glued wood stave or WDMA I.S. 10 structural composite lumber.

7. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.4 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated.

1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied.

2. Locate hardware to comply with DHI-WDHS-3.

3. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.

4. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.

C. Openings: Factory cut and trim openings through doors.

1. Light Openings: Trim openings with moldings of material and profile indicated.

2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00 "Glazing."

2.5 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.

1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

2. Finish faces, all four edges, edges of cutouts, and mortises.

3. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:

1. ANSI/WDMA I.S. 1A Grade: Custom.

2. Staining: As selected by Architect from manufacturer's full range.

3. Sheen: Match existing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 08 71 00 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:

1. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 101.

3.4 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes hardware for doors.

1.2 REFERENCES

A. Americans with Disabilities Act Accessibility Guidelines (ADAAG)

B. American National Standards Institute:

1. ANSI A156 - Complete Set of 24 BHMA Standards (A156 Series) with Binder.
2. ANSI A115 Specifications for Steel Door and Frame Preparation for Hardware
3. ANSI A117.1 Accessible and Usable Buildings and Facilities
4. ANSI A250.6 Hardware on Steel Doors (Reinforcement - Applications)

C. Builders Hardware Manufacturers Association:

1. BHMA Directory of Certified Products.

D. Building Code:

1. International Building Code (IBC), 2021 Edition.

E. Door and Hardware Institute:

1. DHI Publication - Abbreviations and Symbols
2. DHI Publication - Basic Architectural Hardware
3. DHI Publication - Hardware Reinforcements on Steel Doors and Frames
4. DHI Publication - For Processing Hardware Schedules and Templates

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, including:

1. Manufacturer’s technical product fact sheets describing each item of hardware to be provided including material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples:

1. Submit samples of door hardware items if requested by Architect. Accepted samples may be incorporated into Work.

C. Door Hardware Schedule:

1. Submit door hardware schedule prepared by or under supervision of an Architectural Hardware Consultant (AHC).
2. Coordinate Door Hardware Schedule with doors, frames and related work to ensure proper size, thickness, hand, function and finish of door hardware.
3. Format:
    a. Comply with scheduling sequence and vertical form as described in DHI's *Sequence and Format for the Hardware Schedule*.
    b. Horizontal hardware schedules are not acceptable.
4. Organization:
    a. Organize door hardware schedule into hardware sets indicating complete designations of every item needed for each door or opening**.**
    b. Organize door hardware sets in same order as in Door Schedule on Drawings
5. Content:
    a. Type, style, function, size, hand and finish for each door hardware item.
    b. Name and manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols and codes contained in schedule.
    f. Door and frame sizes and materials

1.4 INFORMATONAL SUBMITTALS

A. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions for specified Products.

B. Qualification Data: For Installer and Architectural Hardware Consultant.

C. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of installed cylinders and their master key code.

B. Operation and Maintenance:

1. Provide operation and maintenance data for hardware consisting of technical information as follows:

a. Maintenance instructions for each item of hardware.

b. Catalog pages for each product.

c. Parts list for each product.

d. Copy of final hardware schedule.

e. Copy of final keying schedule.

2. Include a copy of operational and maintenance descriptions in Operation and Maintenance Data Manual.

C. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ANSI A156 series.

B. Furnish hardware marked and listed in BHMA Directory of Certified Products.

1.7 QUALIFICATIONS

A. Manufacturers: All hardware to be as listed in Section 08 71 11 - Hardware Sets.

1. Supplier Qualifications and Responsibilities: A recognized architectural hardware supplier that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides a certified Architectural Hardware Consultant (AHC) available to the Owner, Architect, and Contractor, at reasonable times during the course of the Work for consultation.

2. Installer shall be certified by product manufacturer.

3. Warehousing Facilities: In Project's vicinity.

4. Scheduling Responsibility: Preparation of door hardware and keying schedules.

1.8 PRE-INSTALLATION MEETINGS

A. Prior to the installation of door hardware, the hardware supplier and the project contractor shall arrange and hold a jobsite meeting to instruct the Installers personnel on the proper installation of locks.

1. A letter of compliance, indicating when this meeting is held and who is in attendance, shall be sent to the Architect and Owner.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Package hardware items individually with necessary fasteners, instructions, and installation templates, when necessary; label and identify each package with door opening code to match hardware schedule.

1.10 COORDINATION

A. Installation Coordination Conference: Prior to hardware installation, schedule and hold a meeting for the purpose of reviewing any questions or concerns related to the proper installation and adjustment of door hardware.

1. Attendees: Door hardware supplier, door hardware installer, Owner and Contractor.
2. After the meeting, provide letter of compliance to the Architect, indicating when the meeting was held and who was in attendance.

B. Coordinate Work with other directly affected Sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

1. Provide templates or actual hardware as required to ensure proper preparation of doors and frames.

C. Coordinate Owner's keying requirements during course of Work.

1.11 WARRANTY

A. Furnish three-year warranty for balance of hardware.

1.12 MAINTENANCE MATERIALS

A. Furnish special wrenches and tools applicable for each different and for each special hardware component.

B. Furnish maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. All hardware to be as listed in Section 08 71 11 - Hardware Sets.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC A117.1.

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. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

2.3 DOOR HARDWARE

A. Description:

1. Doors shall comply with Code requirements regarding ADA. Hardware Supplier and Door Supplier shall coordinate hardware applications with Contractor and Architect prior to ordering materials.

2. Keying: As best possible, locks shall have ability to be keyed together and as directed by Owner. Allow for a master-key level. Allow for two change keys per lock and two master keys.

2.4 COMPONENTS

A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Hardware shall be of best grade, entirely free of imperfections in manufacture and finish and shall satisfactorily perform various functions needed. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.

1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.

2. Reinforcing Units: Furnished by door manufacturers; coordinated by hardware supplier or hardware manufacturer.

3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.

4. Finish: Match hardware item being fastened.

B. Hinges: ANSI A156.1, full mortise, 5-knuckle, button tip hinges with non-rising loose pins and ball type bearings; template type; ANSI A156.7 complying with following general requirements unless otherwise scheduled.

1. Widths: Sufficient to clear trim projection when door swings 180 degrees.

2. Number: Furnish minimum three hinges to 90 inches high, four hinges to 120 inches high for each door leaf.

3. Size and Weight: 4-1/2 inch standard.

4. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior and locked out-swinging doors.
5. Tips: Flat button tips.
6. Acceptable Manufacturers: McKinney, Ives, Stanley and Bommer.

C. Locksets and Latchsets:

1. General Requirements:
   a. Shape of lever shall be easy to grasp with one hand and not require tight grasping, tight pinching or twisting of wrist.
   b. Locksets and latchsets shall not require more than 15 lbf to release latch. Locks shall not require use of a key, tool or special knowledge for operation.
   c. Provide manufacturer's standard wrought box strike for each latchset and lockset with curved lip extended to protect frame without catching clothing. Finish shall match hardware set.
   d. Locks and cylinders shall be provided with conventional 6-pin tumblers and 6-pin large format keyed interchangeable cores. Lock cylinder parts shall be made from brass/bronze, stainless steel or nickel silver.
2. Furnish locksets compatible with selected cylinders. Typical 2-3/4 inch backset.
3. Acceptable Manufacturers: Corbin Russwin.

D. Cylinders: ANSI A156.5, match specified locksets and latchsets.

1. Cylindrical locksets and latchsets that comply with ANSI A156.2, Series 4000, Grade 1.
2. Locks shall meet ANSI A117.1, Accessibility Code.
3. Keying: Coordinate with Owner's requirements.
   a. Include construction keying for all keyed locks.
4. Keys: Nickel silver.
5. Supply keys in the following minimum quantities:
   a. 5 master keys.
   b. 6 construction keys.
   c. 2 change keys for each lock (or as directed by Owner).
6. Acceptable Manufacturers: Corbin Russwin.

2.5 AUXILIARY HARDWARE

A. Silencers: ANSI/ BHMA A156.16

1. Tamper-proof resilient cushions designed to absorb shock and noise at openings without gaskets.
2. Three (3) silencers per single door and 2 for pairs of doors.
3. Acceptable Manufacturers: Rockwood.

B. Door Stops:

1. Floor-mounted or wall-mounted types; overhead door holder type where floor or wall stops cannot be used.

2. Acceptable Manufacturers: Rockwood.

2.6 FINISHING

A. Finishes: ANSI A156.18.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify doors and frames are ready to receive door hardware and dimensions are as indicated on approved shop drawings and instructed by manufacturer.

3.2 INSTALLATION

A. General Requirements:

1. Install door hardware item to comply with manufacturers' written instructions using manufacturers supplied fasteners.

2. Securely install finish hardware items in compliance with accepted schedule and templates furnished with hardware.

3. Install locksets and trim after finishing of doors and frames is complete.

4. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

5. Drill and countersink units not factory-prepared for anchorage fasteners. Space fasteners and anchors in compliance with industry standards.

B. Mounting Heights:

1. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.

2. Mounting Heights from Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes where not otherwise indicated.

3.3 FIELD QUALITY CONTROL

A. Architectural Hardware Consultant inspect installation and certify hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.4 ADJUSTING

A. Adjust hardware for smooth operation.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Do not permit adjacent work to damage hardware or hardware finish.

3.6 DOOR HARDWARE SETS

A. General:
   1. All hardware to be as listed in Section 08 71 11 – Hardware Sets.
   2. All hardware to be approved by Owner

B. Manufacturers:
   1. Manufacturer (Abbreviation):
      a. By Manufacturer Supplier (B/S).
      b. Hager Companies (HAG).
      c. Pemko Manufacturing Company (PEM).
      d. Dormakaba (DOR).
      e. Corbin Russwin (CR).
      f. Von Duprin (VD).
      g. Hess Innovations (HS).
      h. Securitron (SA).
      i. Salto (SAL).

C. Finishes:
   1. ANSI – US – Description - Base Metal:
      a. 26D - US26D - Satin Chromium Plated – Any.
      b. 32D - US32D - Satin Stainless Steel, 300 Series - Stainless Steel.
      c. 626 - US26D - Satin Chromium Plated over Nickel - Brass, Bronze.
      d. 689 - US28 - Aluminum Painted – Any.
      e. AL - US28 - Aluminum Mill Finish – Aluminum.
      f. DKB - US10B - Dark Bronze - Any.
      g. GRY – None - Grey - Any.
      h. PRI - USP - Primed for Field Painting – Any.
      i. SP313 – None - Sprayed Dark Bronze – Steel.
      j. DBZ – None - Dark Bronze – Any.

D. Door Hardware Sets: See Drawings.

END OF SECTION 08 71 00

SECTION 08 71 11 – HARDWARE SETS

NOTES

General

1. All hardware to be as listed in Section 08 71 11 - Hardware Sets.
2. All hardware to be approved by Spartanburg Community College
3. The College keyway is Corbin-Russwin 59D1.
4. Electric security hardware and installation, by others, to coordinate with hardware schedule
5. All electric security hardware to comply with egress requirements
6. Thumb turn bolts on egress doors or manual flush bolts on double doors are NOT permitted.
7. Any double-keyed exterior door (not currently applicable on this project) will require accessory indicator and IFC required signage.
8. Any delayed egress doors (not currently applicable on this project) must comply with IFC 1008.1.9.7
9. Any access-controlled egress doors must comply with IFC 1008.1.9.8
10. Any electromagnetically locked egress doors must comply with IFC 1008.1.9.9
11. All existing exterior doors to have ANSI compliant sills, closers and door handles.

MANUFACTURERS

Abbreviation	Name
B/S	By Manufacturer Supplier
HAG	Hager Companies
PEM	Pemko Manufacturing Company
CR	Corbin Russwin
SAR	Sargent
MCK	McKinney

FINISHES

ANSI	US	Description	Base Metal
26D	US26D	Satin Chromium Plated	Any
32D	US32D	Satin Stainless Steel, 300 Series	Stainless Steel
626	US26D	Satin Chromium Plated over Nickel	Brass, Bronze
630	US32D	Satin Stainless Steel	Stain Steel
689	US28	Aluminum Painted	Any
AL	US28	Aluminum Mill Finish	Aluminum
DKB	US10B	Dark Bronze	Any
GRY		Grey	Any
PRI	USP	Primed for Field Painting	Any
SP313		Sprayed Dark Bronze	Steel
DBZ		Dark Bronze	Any

DOOR INDEX

Door Number	Heading	Door Number	Heading	Door Number	Heading
120E	NA	127A	NA	139A	3
123E	NA	128A	NA	147A	5
146E	1	132A	2		
148E	1	133A	4		
102A	2	136A	NA		
107A	2	137A	3		
115A	4	138A	4		

KEYING NOTES

Keying Requirements

1. Key all locks and cylinders to a new master key and as directed by the owner and architect
2. Construction master key all cylinders.
3. All locks to be Corbin Russwin, CR8200 or CR8200-7. Owner to verify.

Furnish

5 Master Keys
2 Construction Master Keys
2 Change Keys per Cylinder

HARDWARE SETS

Hardware Set 1

	Hand
1 SGL Door(s) **146E** LECTURE HALL 1 146 from CORRIDOR 134	LHR
1 SGL Door(s) **148E** LECTURE HALL 2 148 from CORRIDOR 134	LHR

EXISTING SINGLE 3’-0” x 7’-0” x 1 ¾” x WD x HMF x NON-RTD

Unless noted below, all existing door hardware to be reused.
Totals Each Assembly to have:

(2)	1	EA RIM EXIT DEVICE 36”	LC-8816-E-ETL	SAR
(2)	1	CYLINDER AS REQ’D	COORDINATE W/ OWNER	CR

Hardware Set 2

	Hand
1 SGL Door(s) **102A** LOBBY 102 from CORRIDOR 134	LHR
1 SGL Door(s) **107A** OFFICE CORRIDOR 107 from LOBBY 102	RHR
1 SGB Door(s) **132A** SKILLS LAB 132 from CORRIDOR 134	RHR

SINGLE 3’-0” x 7’-0” x 1 ¾” x WD x HMF x NON-RTD

Totals Each Assembly to have:

(9)	3	MORTISE HINGES	TA2714	MCK
(3)	1	EA RIM EXIT DEVICE 36”	LC-8816-E-ETL	SAR
(3)	1	CYLINDER AS REQ’D	COORDINATE W/ OWNER	CR
(3)	1	WALL STOP	236W	HAG
(3)	1	DOOR CLOSER	DC3210	CR
(9)	3	SILENCER	307D	HAG

Hardware Set 3 **Hand**

1 DBL Door(s) **137A** SIM LAB 1 137 from CORRIDOR 136 PAIR
1 DBL Door(s) **139A** SIM LAB 2 139 from CORRIDOR 136 PAIR

UNEVEN PAIR 4'-0" x 7'-0" x 1 ¾" x WD x HMF x NON-RTD
[(1) 3'-0" DOOR + (1) 1'-0" DOOR]

Totals Each Assembly to have:

(12)	3	MORTISE HINGES	TA2714		MCK
(4)	2	KEY-IN-LEVER LOCKSET	CL3851	NZD	CR
(4)	2	CYLINDER AS REQ'D	COORDINATE W/ OWNER		CR
(4)	2	DOOR CLOSER	DC3210		CR
(4)	2	WALL STOP	236W		HAG
(4)	2	MANUAL FLUSH BOLTS	283D	32D	HAG
(12)	6	SILENCER	307D		HAG

Hardware Set 4 **Hand**

1 SGL Door(s) **115A** CRITICAL CARE 115 from OFFICE CORRIDOR 107 LH
1 SGL Door(s) **133A** MED ROOM 133 from SKILLS LAB 132 LHR
1 SGL Door(s) **138A** OBSV 138 from CORRIDOR 136 LHR

3'-0" x 7'-0" x 1 ¾" x WD x HF x NON-RTD

Totals Each Assembly to have:

(9)	3	MORTISE HINGES	TA2714		MCK
(3)	1	KEY-IN-LEVER LOCKSET	CL3851	NZD	CR
(3)	1	CYLINDER AS REQ'D	COORDINATE W/ OWNER		CR
(3)	1	WALL STOP	236W		HAG
(3)	1	DOOR CLOSER	DC3210		CR
(9)	3	SILENCER	307D		HAG

Hardware Set 5 **Hand**

1 SGL Door(s) **147A** PARTITION 147 from LECTURE HALL 1 146 LHR

4'-0" x 9'-0" x 1 ¾" x WD x HF x NON-RTD
[GC TO VERIFY FINAL PARTITION DIMENSIONS PRIOR TO ORDERING DOOR]

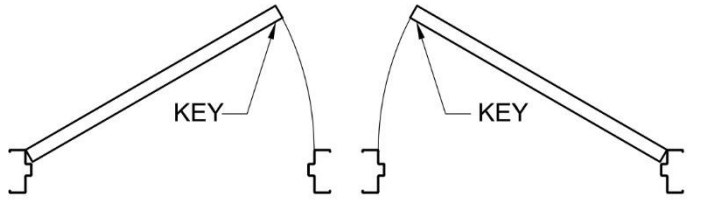
Totals Each Assembly to have:

(3)	3	MORTISE HINGES	TA2714		MCK
(1)	1	KEY-IN-LEVER LOCKSET	CL3857	NZD	CR
(1)	1	WALL STOP	236W		HAG
(1)	1	CYLINDER AS REQ'D	COORDINATE W/ OWNER		CR
(3)	3	SILENCER	307D		HAG

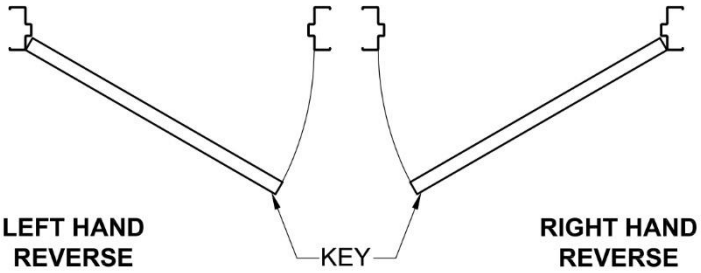
CATALOG CUT SHEET SUMMARY

Manufacturer	Description	Catalog Number
B/S	By Door Supplier	
SARGENT	Rim Exit Device	LC-8816-E-ETL
CR	Surface Closer	DC3210
CR	Cylinder Lock	CR8200 or CR8200-7, Coordinate with Owner
CR	Cylinder Lever (offices & classms)	CL3851 NZD trim
CR	Cylinder Lever (storerooms)	CL3857 NZD trim
HAG	Wall Stop	236W
HAG	Silencer	307D
HAG	Manual Flush Bolt	283D
MCK	Full Mortise Hinge	TA2714

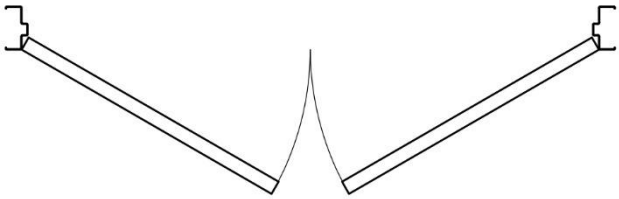
DIAGRAM OF DOOR HAND



LEFT HAND **RIGHT HAND**



LEFT HAND REVERSE **RIGHT HAND REVERSE**



PAIR SWING

Product Catalog

SARGENT
ASSA ABLOY

80 Series
Exit Device

Experience a safer
and more open world

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Features and Innovations

80 Series

SARGENT manufactures a full line of exit devices including vertical rod, rim and mortise for both standard and narrow stile doors. These devices provide the best combination of simplicity, strength, durability, aesthetics and innovation and are perfect for applications such as commercial office buildings, medical and educational institutions.

Simplicity

- Easy installation and maintenance-free design
- "True" architectural hardware finishes consistent with BHMA/ANSI standards
- Few moving parts – less wear
- Modular construction

Strength & Durability

- Made of finest component materials
- Heavy duty mounting construction
- Built to withstand abusive conditions
- 5 Year warranty

Hurricane-Resistant Products and Certifications

- UL Certified Latching Hardware and Assemblies (ZHEM & ZHLL)
- Product-specific detailed certifications and listings
- Available with Rim, Mortise, SVR & CVR devices

Innovation

- Broad offering of electro-mechanical solutions for the most demanding access/egress control applications
- **MicroShield®** anti-microbial finish coating offers a new level of protection
- **SARGuide™** exit device contains an electroluminescent touchpad to enhance the visibility of exit locations in dark or smoke-filled passages and effectively improve the safety of any public building
- CTL (Center and Top Latching) Vertical Rod Devices offer less bottom rod convenience with true center latching for added security

Security

- Double cylinder functions available
- Torx® and spanner screws
- Anti-vandal trim options
- Master keying with SARGENT Security Key systems available (Signature, Keso F1, Keso and XC)

EcoFlex®

- Reduces energy consumption up to 95% for exit trim, as certified by Green Circle, which lowers operating costs; assists with load reduction in optimizing energy performance credit in LEED, and reduces the number of power supplies requires.
- Field configurable to fail-safe or fail-secure, and operates from 12-24VDC, offering greater flexibility in system design.
- Innovative actuator design provides superior reliability through higher performance and reduced maintenance; the ability to have longer cable runs without negatively impacting lock function. It reduces the risk of voltage drops and eliminates inductive kickback, and lowers the total cost of owner ship.

MicroShield® Coating

MicroShield®

ASSA ABLOY Group companies offer MicroShield®, an anti-microbial coating for door hardware. MicroShield uses proven silver ion-based technology from Agion®, a leading provider of antimicrobial solutions, to stem the spread of bacteria and other microbes.

MicroShield® is a trademark of the respective ASSA ABLOY Group company.

The Agion antimicrobial is not intended as a substitute for good hygiene. Coated products must still be cleaned to ensure the surfaces will be free of destructive microbes. ASSA ABLOY makes no representations or warranties, express or implied, as to the efficacy of the Agion antimicrobial. A copy of the Agion warranty is available upon request. Agion is a registered trademark of Agion Technologies, Inc., Wakefield, MA, USA.

SARGuide™

The TL- SARGuide Electroluminescent exit device increases visibility of exit locations in dark or smoke-filled passages, supplementing existing codes for egress lighting.

- SARGuide utilizes state-of-the-art FLATLITE electroluminescent lighting from E-Lite Technologies Inc.
- Can be wired in conjunction with Fire Alarm system or can be wired for continuous operation.
- UL Listed for use on panic (UL 305) and fire-rated (UL 10C) exit devices.

The PL- SARGuide Photoluminescent Exit Device is a non electrical option which produces visible EXIT signage in darkness or low lit areas.

- Approved for use in New York City in accordance with RS 6-1 and RS 6-1A.
- Recharges from ambient light.
- No wiring or maintenance needed.

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UL Fire Door Ratings and Openings Sizes

80 Series

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Maximum Door Opening-Fire Doors

Type	Exit Device	Door Material	Single Door	with 12-HC980 or 12-980 or 12-HCL980 Mullion	with 12-L980	with 12-HD980 Mullion	VR/VR Doors Swing Same Direction	SVR/Mortise Doors Swing Same Direction	CVR/Mortise MD Doors Swing Same Direction	CVR/Mortise WD Doors Swing Same Direction	VR/VR Double Egress
Rim	12-8800	Metal	3 Hour 4' x 10'	3 Hour 8' x 8'	1.5 Hour 8' x 8'	3 Hour 8' x 10'	—	—	—	—	—
	12-8500	Metal	3 Hour 4' x 8'	3 Hour 8' x 8'	1.5 Hour 8' x 8'	3 Hour 8' x 8'	—	—	—	—	—
Mortise Lock	12-8900	Metal	3 Hour 4' x 10'	—	—	—	—	3 Hour 8' x 8'	3 Hour 8' x 10'	—	—
	12-8300	Metal	3 Hour 4' x 10'	—	—	—	—	—	3 Hour 8' x 10'	—	—
SVR	12-FM8700	Metal	3 Hour 4' x 8'	—	—	—	3 Hour 8' x 8'	—	—	—	—
	12-8700	Metal	—	—	—	—	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	3 Hour 8' x 8'
	12-NB8700	Metal	—	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'
CVR	12-MD8600	Metal	—	—	—	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'
	12-NB-MD8600	Metal	—	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'
	12-MD8400	Metal	—	—	—	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'
	12-NB-MD8400	Metal	—	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'
CVR/Mortise	12-LS8600	Metal	3 Hour 4' x 10'	—	—	—	—	—	—	—	—
	12-LP8600 & 12-LR8600	Metal	—	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'

Any retrofit or other field modification to a fire rated opening can potentially impact the fire rating of the opening, and Sargent Manufacturing Company makes no representations or warranties concerning what such impact may be in any specific situation. When retrofitting any portion of an existing fire rated opening, or specifying and installing a new fire-rated opening, please consult with a code specialist or local code official (Authority Having Jurisdiction) to ensure compliance with all applicable codes and ratings.

Notes:

- Please contact door manufacturer for specifications regarding fire door construction.
- Consult wood door manufacturers for current UL listing.

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Windstorm Certifications

80 Series

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Windstorm Certifications: Florida Building Codes & UL Listings

SARGENT Manufacturing's products meet building codes that require hurricane, windstorm and FEMA certifications, including some of the most stringent building codes as specified in the Florida Building Code, Miami Dade Code and the International Building Code. Listed below are certifications and standards met by the 80 Series lock.

Florida Building Code: FL2998
UL Certification Directory: ZHEM.R21744 – Latching Hardware

ANSI/SDI-BHMA A250.13	"Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies"
ANSI/ASTM E330	"Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference"
ANSI/ASTM E1886	"Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials"
ASTM E1996	"Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes"
(TAS) 201	"Impact Test Procedures"*
(TAS) 202	"Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference"
(TAS) 203	"Criteria for Testing Products Subject to Cyclic Wind Pressure Loading"*

* Published in the "Florida Building Code"

Any retrofit or other field modification to a fire rated opening can potentially impact the fire rating of the opening, and Sargent Manufacturing Company makes no representations or warranties concerning what such impact may be in any specific situation. When retrofitting any portion of an existing fire rated opening, or specifying and installing a new fire-rated opening, please consult with a code specialist or local code official (Authority Having Jurisdiction) to ensure compliance with all applicable codes and ratings.

UL Certification Directory: ZHLL.R21744 – Products for Use in Windstorm-rated Assemblies

Certifications to meet assembly requirements are done in conjunction with doors from ASSA ABLOY Group companies CECO DOOR and CURRIES.

ASTM E330	"Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference"
ANSI/ASTM E1886	"Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials"
ASTM E1996	"Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes"
AAMA/WDMA/CSA 101/I.S.2/A440	"Standard/Specification for Windows, Doors, and Unit Skylights"
FEMA Publication 320 (2014)	"Taking Shelter From the Storm: Building a Safe Room for Your Home or Small Business", investigated with respect to impact and pressure requirements only.
FEMA Publication 361 (2015)	"Design and Construction Guidance for Community Safe Rooms", investigated with respect to impact and pressure requirements only.
ICC 500 (2014)	"ICC/NSSA Standard for the Design and Construction of Storm Shelters", investigated with respect to impact and pressure testing. Minimum missile impact speeds vary with the design wind speed desired for a particular product. The information below correlates design wind speed to the minimum missile speeds as discussed in Table 305.1.1 of ICC 500

Any retrofit or other field modification to a fire rated opening can potentially impact the fire rating of the opening, and Sargent Manufacturing Company makes no representations or warranties concerning what such impact may be in any specific situation. When retrofitting any portion of an existing fire rated opening, or specifying and installing a new fire-rated opening, please consult with a code specialist or local code official (Authority Having Jurisdiction) to ensure compliance with all applicable codes and ratings.

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8888/8810 Multi-Function Rim Exit Device and Trims

80 Series

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8888/8810 Multi-Function exit device and trim

- Device & trim sold separately; easy to mix and match
- Designed for standard width stile applications on wood and metal doors
- 7 functions available as determined by the trim function
- 3 trim designs available:
  - 700 ET Controls
  - 88 Lever & Rose trim
  - Pull trims
- Single and double door applications with a mullion

The 8888/8810 Rim Exit Device

- ANSI/BHMA A156.3 - Grade 1
- UL10C (Fire) and UL305 (Panic) Listed
- Device is non-handed
- ANSI/BHMA architectural finishes
- Four standard sizes available

To Order: Specify options, 8888 or 8810, Rail Size and Finish
Example: 12-19-8888F x 32D

Specifications

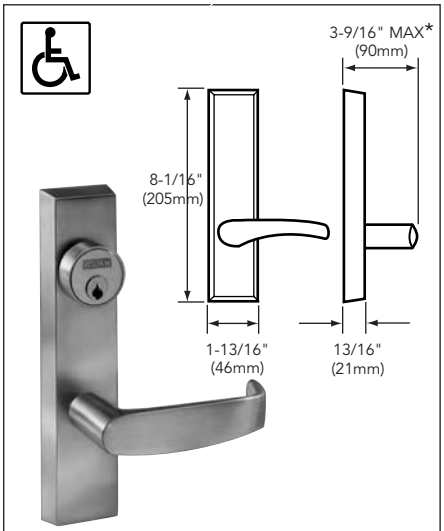
Door Type	Wood or metal Doors
Door Thickness	1-3/4" (44mm) minimum thickness. For doors over 1-3/4" to 2-1/4" thick, specify thickness and order as 31-
Stile	4-1/2" (114mm) minimum stile width
Mounting	Supplied standard with wood and machine screws Available with through-bolts and mortise nuts
Chassis Cover	Cold drawn stainless steel, brass or bronze with ANSI/BHMA Finishes
Chassis	Nonferrous alloy (Panic) Ferrous alloy (Fire Rated)
Rails	Roll Formed Stainless Steel, Brass or Bronze with ANSI/BHMA Finishes
Hand	Non-handed
Dogging Feature (Non 12- only)	Hex key dogging standard on non fired rated devices; specify 16- for cylinder dogging (#41 cylinder supplied)
Latchbolt	Stainless steel, 3/4" (19mm) throw
Strike	649 Strike supplied standard for panic & fire rated openings
Fire Exit Hardware	See chart - Page 6

Rail Chart

- Rails are available in 4 sizes, use door width to determine size needed.
- Rails will be factory cut to size if door width is supplied or can be cut in the field

Stock Size	Door Widths	Remarks
E	24" to 32" (61cm to 81cm)	No cutting required for 32" (81cm) door
F	33" to 36" (84cm to 91cm)	No cutting required for 36" (91cm) door
J	37" to 42" (94cm to 107cm)	No cutting required for 42" (107cm) door
G	43' to 48" (110cm to 122cm)	No cutting required for 48" (122cm) door

700 Series ET Control



The 700 Series ET Control is sold separately from the exit device and can be used with 8888 & 8810 Exit Device. The trim is non handed and is through-bolted to the chassis for greater security and durability. Available in 7 functions and SARGENT Studio, Coastal and standard lever designs to accommodate most requirements.

- ANSI/BHMA Finishes
- Easy operating lever handle allows convenient one hand operation
- ET trim is not available in 32 or 32D
- Stainless steel levers are available

88 Lever and Rose Trim

LB
ROSE: L
LEVER: B

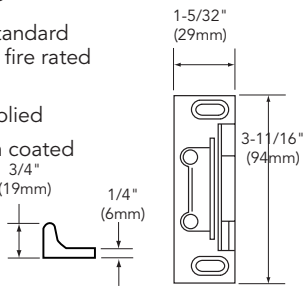
- The 88 Lever and Rose Trim is sold separately from the exit device and can be used with 8888 & 8810 Exit Device.
- The trim is non handed and is through-bolted to the chassis for greater security and durability. Available in 4 functions and 4 lever designs to accommodate most requirements.

688 Trim Retrofit Kit

- 688 Trim Retrofit kit allows an 8810/8888 rim exit with an ET to replace Von Duprin's 98/99 series exit with trim with minimal door prep.
- Order as: 688 Kit

649 Strike

- Supplied standard for panic & fire rated openings
- Surface applied
- Black nylon coated



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8888/8810 Multi-Function Rim Exit Device and Trims

80 Series

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How to order 8888/8810 Multi-Function Exit Devices:

Specify the following:

Options	Series	Rail	Finish
16-	8888 or 8810	F	32D

- All trims and functions listed on this page, work with 8888 & 8810 Exit Devices
- Available options listed at the right
- 8888 & 8810 are identical products and are non-handed
- Exit devices are not available in 14, 15, 26 and 26D finishes

How to order trim for 8888 & 8810 Exit Devices:

Specify the following:

Options	Trim Designation	Hand	Finish
10-	713-8 ET_*	RHR	26D
10-	88-CL_ *	Non-Handed	10B
60-	814-MSL	RHR	04

*Specify lever design
Available Options listed at the right

Options

Exit	Trim
12- *16- 19- 43- 5CH- GL- CPC- LC- LD- PL-	10- 11- 11-70- 11-72-7P- 11-73-7P- 21- 22- 60- 63- 64- +70- +72- +73- +73-7P- +65-73- +65-73-7P- BR- LC- SC- SE- ++ SF- *** SG-

* Supplied with standard 41 cylinder, for cylinder options, see trim options

** Only available with 15, 26D and 32D finishes

\+ Single crossed options are not available with 88 Lever & Rose Trim with J Lever

++ Double Cross options are only available with 88 Lever & Rose Trim

700 Series ET Trim

700 Series ET Controls

To order: Specify options followed by trim designation, lever design, hand and finish (as shown to the right).

Example: 11-SG-713-8 x RHR x 10B

Freewheeling Trim

The lever rotates when the door is locked preventing excessive force from being applied to the horizontal lever

SARGENT Function Numbers	ANSI Function Numbers	Description & Cylinder Info (1-3/4" Door)	Trim Designations
04	03	Night Latch Key Retracts Latch #34 Cylinder Supplied	704 ET_ x Hand & Finish
10	02	No outside operation (No Cylinder) ET Control is used as Pull Only	710 ET_ x Hand & Finish
13	08	Key Outside Unlocks/Locks Trim #41 Cylinder Supplied	713-8 ET_ x Hand & Finish
15	14	Passage Only (No cylinder)	715-8 ET_ x Hand & Finish
40	02	Freewheeling Trim - No outside operation (No Cylinder) Dummy Trim	740 ET_ x Hand & Finish
43	08	Freewheeling Trim - Key Outside Unlocks/Locks Trim #41 Cylinder Supplied	743-8 ET_ x Hand & Finish
44	03	Freewheeling Trim - Key Retracts Latch #34 Cylinder Supplied	744 ET_ x Hand & Finish

Note: ET trim is not available in 32 (629) or 32D (630)

88 Lever and Rose Trim

To order: Specify options followed by trim designation, lever design and finish (as shown to the right).

Example: 10-SG-88-CLP x 26D

ANSI Function Numbers	Description	Trim Designations
03	Key Retracts Latch Cylinder Supplied	88-KL_ x Finish
02	No outside Operation (No Cylinder) Dummy Trim	88-DL_ x Finish
08	Key Outside Unlocks/locks Trim Cylinder Supplied	88-CL_ x Finish
14	Passage Only (No cylinder)	88-LL_ x Finish

Lever Designs available for 88 Lever & Rose Trim are L, B, J & P

Note: For 88 Lever & Rose trim, the 1st letter is the function, the 2nd is the "L" Rose Design & the 3rd is the lever design specified

Available Finishes

SARGENT Finishes	BHMA Finishes
03	605
04	606
09	611
10	612
10B	613
10BE	613E
10BL	613L
14	618
15	619
20D	624
26	625
26D	626
32	629
32D	630
BSP	—
WSP	

Keyed & Non Keyed Pull Trim for 8888 & 8810 Devices

Use the six digit designation (Ex "866-MAL") when ordering trim without an Exit Device, always specify options, designation, finish & hand

Example: 10-SG-814-FSW x 04 x RHR

Trim Designations

SARGENT Function #'s	ANSI	Description & Cylinder Info. (1-3/4" Door)	814-FSL*	814-FSW*	814-MSL*	814-PSB*	814-STS
04	03	Key Retracts Latch #34 Cylinder Supplied					
10	02	No O/S Operation or Cylinder (Pull Only)	810-FLL	810-FLW	810-MAL	810-PTB	810-STS

Note: 88 Lever & Rose trim & ET's are not available in 32(629) or 32D(630)

* FSL, FSW, MSL and PSB trims are used with (HC-& 12-) 8888 and 8804 only and are the same as FLL, FLW, MAL and PTB pulls, except for cylinder hole located 3/8" (9mm) lower

Note: Pulls and thumb piece trims are not available in 14, 15, 26 or 26D

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8800 Rim Exit Device

80 Series

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8800 Series
Rim Exit Device

8800 Features

- Designed for standard width stile applications on wood and metal doors
- Also available as an HC8800 or WS8800 for hurricane-resistant applications, see Hurricane-Resistant section of this catalog
- Single point rim latching device
- Single door & double door applications with mullions
- Quiet operation and solid security
- ANSI/BHMA A156.3 - Grade 1
- UL10C (Fire) and UL305 (Panic) Listed

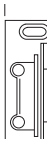
Specifications — 8800 Series Rim Exit Device

Door Type	Metal Doors
Door Thickness	1-3/4" (44mm) minimum thickness. For doors over 1-3/4" to 2 1/4" thick, specify thickness and order as 31-
Stile	4-1/2" (114mm) minimum stile width
Rail sizes as determined by door width	Rails are available in 4 sizes, use door width to determine size needed. Rails will be factory cut to size, if door width is supplied • E Rail for 24" to 32" door widths, No cutting required for 32" door • F Rail for 33" to 36" door widths, No cutting required for 36" door • J Rail for 37" to 42" door widths, No cutting required for 42" door • G Rail for 43" to 48" door widths, No cutting required for 48" door
Strike	649 Standard Black Nylon Coated
Optional Strikes	642, 644 and 613
Dogging Feature	Hex key dogging standard on non fired rated devices; specify 16- for cylinder dogging (#41 cylinder supplied)
Electric Options	AL- Alarm PL- SARGuide Photoluminescent Coated TL- SARGuide Illuminated Touchpad
	49- Indicator 53- LX Latchbolt Monitor 54- Outside Lever Monitoring 55- Request-to-Exit Signal - Rail Monitoring 56- Remote Latch Retraction 57- Delay Egress & Electromagnets 58- Electric Dogging 59- Electroguard – Self Contained Delayed Egress
Mounting Fasteners	Supplied standard with wood and machine screws Available with through-bolts and mortise (sex) nuts
Latch Bolt	Stainless steel, 3/4" (19mm) throw
Device Centerline from Finished Floor	41" (1041 mm) for Standard Applications
Center Case Dimensions	8-3/8" (213mm) x 2-5/8" (67mm)
Projection	Pushbar Neutral – 3" (76 mm) Pushbar Depressed – 2-1/8" (54 mm)
Fire Exit Hardware	See Chart – Page 6

49- Lock/Unlock Indicator Option

- Displays whether the door has been secured by the inside cylinder.
- Red icon indicates locked
- White icon indicates unlocked
- Dogging overrides 49- functionality (must order less dogging)
- Available on 8816 and 8866 functions only

649 Strike



- Supplied standard for panic & fire rated openings
- Surface applied
- Black nylon coated

688 Trim Retrofit Kit

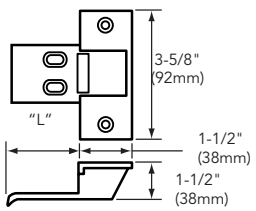
- 688 Trim Retrofit kit allows an 8800* Series rim exit with an ET to replace Von Duprin's 98/99 Series exit with trim with minimal door prep.

* Except for 16 function

- Order as: 688 Kit

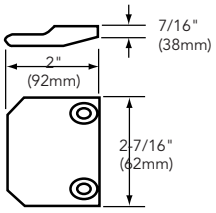
Alternate Strikes For 8800 Rim Devices

642 Strike



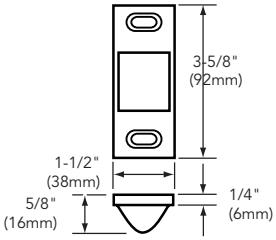
- Mortised. Dimension "L" equals door thickness plus 1/2" (13mm). Black nylon coated on lip only

644 Strike



- Surface applied. For use on pairs of doors without mullion. Ductile Iron. Black nylon coated

613 Strike



- Half mortised. Black nylon coated

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8800 Functions and Trims

80 Series

SARGENT
ASSA ABLOY

Options	Series	Function	Rail Lgth	Trim	Hand	Outside Finish	Inside Finish	Door Width
F1-83-56	88	13	F	ETL	RHR	26D	32D	36"

700 Series ET Trim

Exits with ET Trim, specify lever design after the ET designation (e.g., ETL)

Lever Designs for ET Controls

A, B, E, F, J, L, P, W

Also available with Coastal Series & Studio Collection Levers

ET Designation with Suffix (Used to order ET without device)

8800 Series: 704, 706-8, 710, 713-8, 715-8, 716, 740, 743-8, 744, 746-8, 773-8, 774-8, 775-8 & 776-8

Freewheeling Trim

The lever rotates when the door is locked preventing excessive force from being applied to the horizontal lever

Electrified ET Trim

Voltage must be specified for the following functions: 73, 74, 75 and 76. Specify: 12VDC or 24VDC

SARGENT Function Numbers	ANSI Function Numbers	Description & Cylinder Info (1-3/4" Door)	ANSI Type 1 8800 Panic & Fire
04	03	Night Latch Key Retracts Latch #34 Cylinder Supplied	8804 x ET_
06	09	Key unlocks Trim, Trim retracts latch/ Trim relocks when key is removed #41 Cylinder Supplied	8806 x ET_
10	01	No outside operation (No Cylinder)	8810
10	02	No outside operation (No Cylinder) ET Control is used as Pull Only	8810 x ET_
13	08	Key Outside Unlocks/locks Trim #41 Cylinder Supplied	8813 x ET_
15	14	Passage Only (No cylinder)	8815 x ET_
16	10	Key Outside Retracts Latch; Key Inside Unlocks/Locks O/S Trim O/S #34 Cylinder & I/S #44 Cylinder Supplied	8816 x ET_
40	02	Freewheeling Trim - No outside operation (No Cylinder) Dummy Trim	8840 x ET_
43	08	Freewheeling Trim - Key Outside Unlocks/locks Trim #41 Cylinder Supplied	8843 x ET_
44	03	Freewheeling Trim - Key Retracts Latch #34 Cylinder Supplied	8844 x ET_
46	09	Freewheeling Trim - Key unlocks Trim, Trim retracts latch/ Trim relocks when key is removed #41 Cylinder Supplied	8846 x ET_
73		Electrified ET Trim - Fail Safe Power Off, Unlocks Lever (No Cylinder)	8873 x ET_
74		Electrified ET Trim - Fail Secure Power Off, Locks Lever (No Cylinder)	8874 x ET_
75		Electrified ET Trim - Fail Safe Power Off, Unlocks Lever, Key Retracts Latch #34 Cylinder Supplied	8875 x ET_
76		Electrified ET Trim - Fail Secure Power Off, Locks Lever, Key Retracts Latch #34 Cylinder Supplied	8876 x ET_

Note: Exit devices are available in all standard finishes, except 14, 15, 26 & 26D. With these finishes, exit devices are supplied in 32 or 32D to match accordingly. 32 or 32D is automatically supplied when 26 or 26D is specified. For nickel finishes, specify 14/32 or 15/32D to receive nickel finished trims and stainless exit devices

Pull & Thumbpiece Trim Section

Trim Designations

- Use three letter designations (Ex "PTB") when ordering the Exit Device with trim
- Use the six digit designation (Ex "866-MAL") when ordering trim without an Exit Device, always specify finish

Series

8800
Panic & Fire

SARGENT Function Numbers	ANSI Function Numbers	Description & Cylinder Info. (1-3/4" Door)	814-FSL*	814-FSW*	814-MSL*	814-PSB*	814-STS	862 Pull	8800 Panic & Fire
04	03	Night Latch Key Retracts Latch #34 Cylinder Supplied	814-FSL*	814-FSW*	814-MSL*	814-PSB*	814-STS	862 Pull	8804 x Trim Designation
10	02	No O/S Operation or Cylinder (Pull Only)	810-FLL	810-FLW	810-MAL	810-PTB	810-STS	862 Pull	8810 x Trim Designation
28	15	Passage Only (No cylinder)	828-FLL	828-FLW	828-MAL	828-PTB	828-STS	N/A	8828 x Trim Designation
63	05	Key Outside Unlocks/ Locks Thumbpiece #34 Cylinder Supplied	866-FLL	866-FLW	866-MAL	866-PTB	866-STS	N/A	8863 x Trim Designation
66	07	Key Outside Retracts Latch; Key Inside Unlocks/Locks O/S Trim O/S #34 & I/S #44	866-FLL	866-FLW	866-MAL	866-PTB	866-STS	N/A	8866 x Trim Designation

* FSL, FSW, MSL and PSB trims are used with (HC-& 12-) 8888 and 8804 only and are the same as FLL, FLW, MAL and PTB pulls except for cylinder hole located 3/8" (9mm) lower.
Note: Thumbpiece trims for 63 and 66 function devices are identical and are identified as 66 function when trim is ordered separately.
Note: FLW & FSW trims are not available in 32(629) or 32D(630).
Note: Pulls and thumb piece trims are not available in 14, 15, 26 or 26D.

Options

8800

Mechanical Options:
12-
16-
19-
31-
36-
37-
43-
53-
54-
55-
56-
56-HK-
57-
58-
59-
5CH-
BC-59-
76-
85-
86-
87-
AL-
BT-
CPC-
GL-
LD-
PL-
** SG-
TB-
TL-

Cylinder Options:
10-
10-21-
10-63-
11-
11-21-
11-60-
11-63-
11-64-
11-70-7P-
11-72-7P-
11-73-7P-
11-65-73-7P-
21-
22-
51-
52-
60-
63-
64-
70-
72-
73-
65-73-
65-73-7P-
73-7P-
81-
82-
F1-82-
83-
F1-83-
84-
BR-
LC-
*SC-
*SE-

* Options are not available with 8816
** Only available with 15, 26D and 32D finishes

Available Finishes

SARGENT Finishes	BHMA Finishes
03	605
04	606
09	611
10	612
10B	613
10BE	613E
10BL	613L
14	618
15	619
20D	624
26	625
26D	626
32	629
32D	630
BSP	—
WSP	

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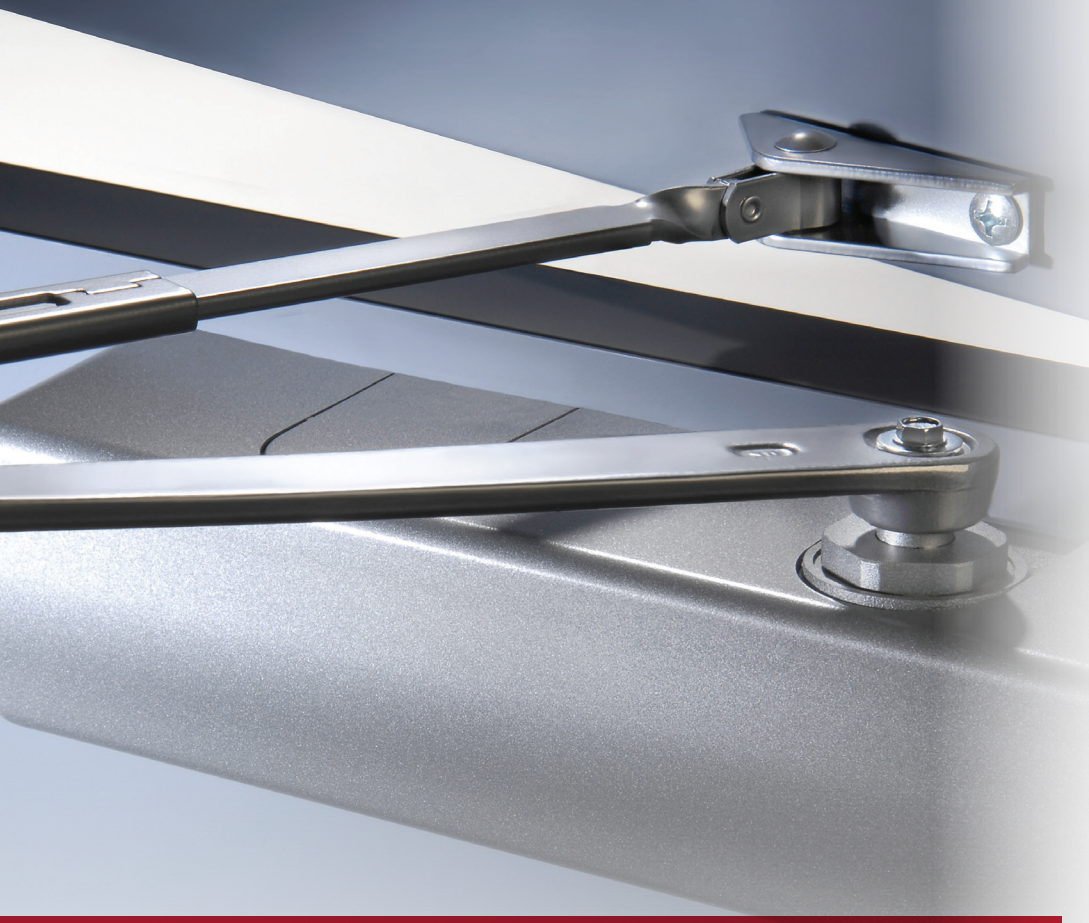

Corbin Russwin

ASSA ABLOY

DC3000 Series
Door Closers

Product Catalog

Experience a safer
and more open world

Corbin Russwin
ASSA ABLOY

Applications

DC3000 Series

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Helpful Terms 14
How to Specify..... 15

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DC3000 Series

Applications

The mid-priced, cost-effective choice for high-traffic situations. The DC3000 Series Door Closers fulfill security and life safety requirements by ensuring reliable latching for access control and fire code compliance, along with ease of operation and precise adjustability for barrier-free code compliance. Ideal for virtually all door openings and draft conditions in both new construction and renovations, including:

- Schools and universities
- Health care
- Government
- Commercial and industrial
- Office and retail
- Transportation and utilities
- Hotels and conference centers
- Religious

Advantages

- Meets or exceeds ANSI/BHMA A156.4 Grade 1 requirements
- Compliance with building and barrier-free codes
- Up to full 180° door opening
- One-piece seamless steel spring tube seals in hydraulic fluid
- Tapered valves allow precise adjustment
- Cast iron body
- Quik-Install™ mounting bracket speeds installation, reducing cost and errors
- 15-year limited warranty
- UL10C positive pressure for up to 3-hours
- Powder painted arms and retrofit plates

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45045 06/23

Overview of Features

Features	DC3200 Closers
Spring power	Multi-sized; Adjustable 1-6
Latching speed valve	Standard
Closing speed valve	Standard
Backcheck intensity valve	Standard
Delayed action valve	Optional
Parallel arm mounting	Optional
Top jamb mounting	Optional
Hold open	Optional
Sex nuts and bolts (SNBs)	Optional
Corrosion protection	Optional
Full cover	Standard
15-year warranty	Standard
Heavy-duty regular arm	Optional
Heavy-duty parallel arm	Optional
Backstop arm	Optional

Finishes		
Old Designation	**Description**	**Specify**
USP	Primed	600
N/A	Dark Oxidized Satin Bronze - equivalent	613E
SBL	Silver Aluminum	689
DBL	Dark Bronze	690
LBL	Light Bronze	691
FBL	Black	693
GBL	Satin Brass	696
N/A	Black Suede Powder Coat	BSP
N/A	White Suede Powder Coat	WSP

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Features

DC3000 Series

Features

Spring Power
Multi-sized; fully adjustable 1 through 6.

Handing
Non-handed.

Body
Cast iron case with seamless cold-headed steel spring tube.

Arm
Standard: forged steel. Optional arms, pages 7 and 8.

Spindle
Cold-headed heat-treated steel.

Piston
1-3/8" diameter; Precision machined, heat-treated steel.

Springs
Chrome silicon wire.

Valves
Latching speed, closing speed and backcheck intensity valves standard. Delayed action valve optional (preset for 20 seconds; between 90° and 70° for all mountings.) To order, specify M71.

Seals
"O"rings.

Fluid
Standard high lubricity extreme temperature hydraulic fluid.

Degree of Opening
Up to full 180° opening standard for regular, top jamb and parallel arm mountings, conditions permitting.

Power Adjustment Arm Bracket
15% adjustment standard.

Cover
Non-metallic full cover.

Mountings
Standard: regular arm and top jamb. Parallel arm or tri-style packaging - specify DC3210 Optional mountings; see page 6.

Mounting Bracket
Quik-Install™ mounting bracket standard.

Fasteners
Standard: self-drilling screws.
Optional: sex nuts and bolts (SNBs); Specify M54.

Corrosion Protection
Painted protective coating on all metal surfaces for use in corrosive environments. Specify M75.

Warranty
15-year limited warranty. Refer to Corbin Russwin price book for details.

Certification/Compliance

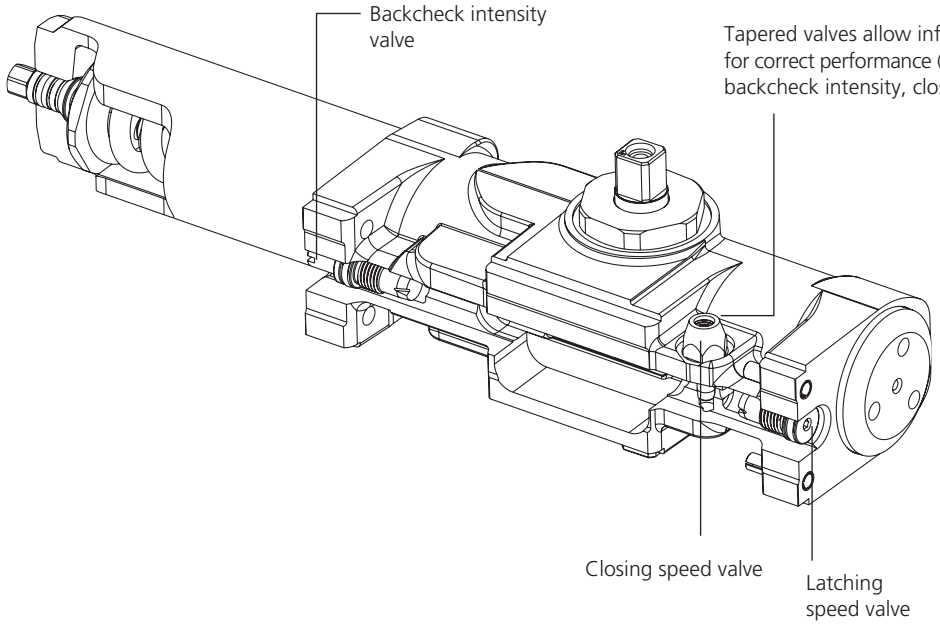
Barrier-Free Code Compliance
The DC3000 Series Door Closers listed below conform to the 5 lbf. maximum door opening force requirement for non-fire-rated interior hinged doors, according to:

Americans with Disabilities Act (ADA)
Complies with the Accessibility Guidelines for Buildings and Facilities, Section 4.13.11.

ANSI/BHMA Certified
A156.4, Grade 1.
A117.1.

UL10C positive pressure up to 3 hours UL-cUL
Listed for fire and cycle requirements.

CAUTION: Door Closers for Low Opening Force Applications:
Door closers installed in openings required to meet the requirements of the Americans With Disabilities Act or ANSI/BHMA Standard A117.1, when adjusted to meet those requirements, may not provide adequate closing power to dependably close and latch the door based on opening or site conditions.



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Mountings

DC3000 Series

DC3200 Regular Arm Mounting

- Most common mounting, providing the greatest closing efficiency
- Closer is mounted on the pull side, with the arm perpendicular to the face of the door
- Arm bracket is attached to the door frame

DC3210 Parallel Arm Mounting

- Allows inside application of closer on out-swinging doors
- Closer is mounted on the push side, with the arm parallel to the face of the door
- Arm does not project from the opening

DC3220 Top Jamb Mounting

- Accommodates reveals up to 3-1/4" (83mm)
- Closer is mounted on the push side, with the arm perpendicular to the face of the door
- Arm bracket is mounted on the door
- Minimum 1-3/4" (44mm) top jamb required

Contact factory if door weight exceeds 250 lbs.

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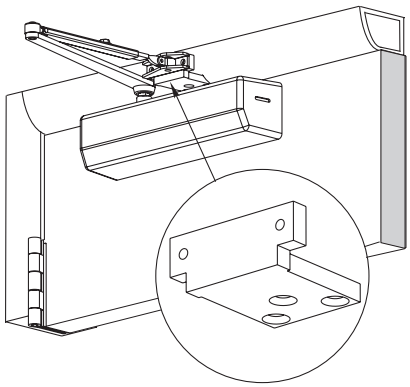
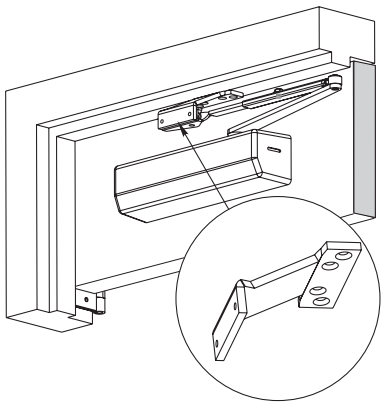
Mountings

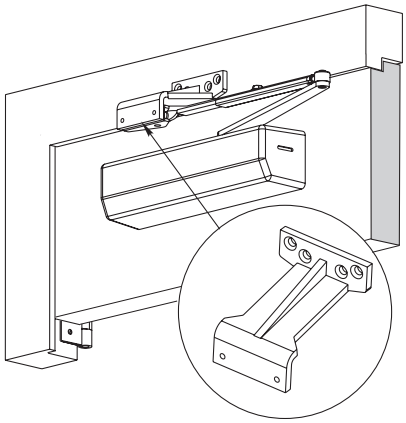
DC3000 Series



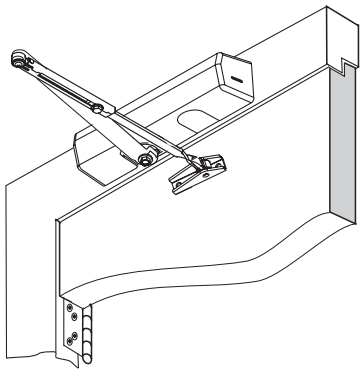
Regular Arm Mounting with Mortise Arm Bracket
Used on inadequately reinforced frames, such as those with bull nose trims.



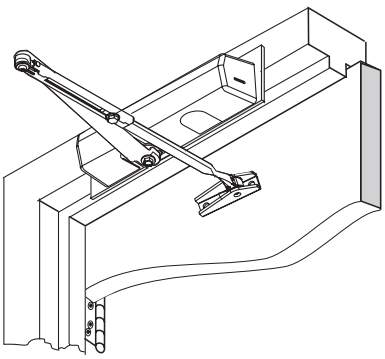
Parallel Arm with Offset Angle Bracket Mounting
Allows parallel arm mounting when used with an overhead door holder.



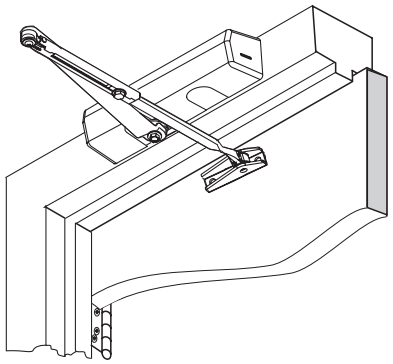
Parallel Arm Mounting with Flush Transom Bracket
Allows parallel arm mounting on flush transom applications.



Top Jamb Flush Transom Mounting
Closer is top jamb mounted on the push side; arm is attached to the door.



Narrow Frame Mounting
For use when the frame is too narrow for a normal top jamb or top jamb track mounting. (Shown with 188F65 drop plate)



Top Jamb Deep Reveal Mounting
For reveals greater than 3-1/4" (83mm), up to 7-1/4" (184mm).

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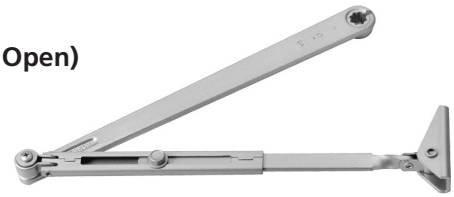
Door Closer Arms

DC3000 Series

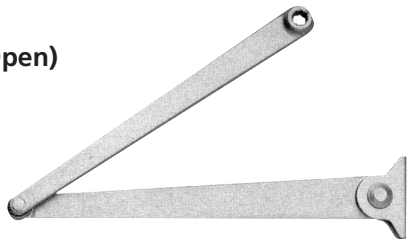
688F95
(Non-Hold Open)



688F77
(Hold-Open)

Regular Arm
- Used with regular arm mounting (pull side) and top jamb mounting (push side)
- Non-Hold Open arm standard on the DC3200
- Hold Open arm optional, specify closer x **A1***

597F52
(Non-Hold Open)



Heavy-Duty Regular Arm
- Recommended for high-use, high-abuse environments
- Tamper-resistant, solid forged steel riveted arm
- Mounted on pull side
- Optional on DC3200 closer, specify closer x **A10**

688F95 x 188F41
(Non-Hold Open)

688F77 x 509F49
(Hold Open)

Parallel Arm
- Mounted on push side
- Non-Hold Open arm combines regular arm with parallel arm mounting bracket
- Hold Open arm combines regular hold open arm with parallel arm mounting bracket
- Non-Hold Open arm standard on the DC3210
- Hold Open arm optional, specify closer x **A1***

***Not allowed by code on fire doors.**

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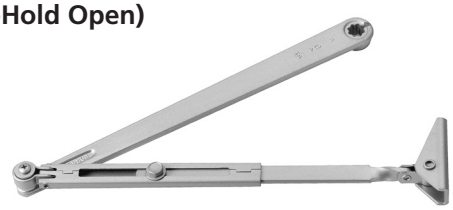
Door Closer Arms

DC3000 Series

688F95
(Non-Hold Open)



688F77
(Hold Open)

Top Jamb

- Used with top jamb mounting (push side); for reveals up to 3-3/4" (95 mm)
- Non-Hold Open arm standard on the DC3220
- Hold Open arm optional, specify closer x **A1***

689F02
(Non-Hold Open)

689F01
(Hold Open)

Heavy-Duty Parallel Arm

- Recommended for high-use, high-abuse environments
- Tamper-resistant, solid forged steel riveted arm
- Mounted on push side
- Optional on DC3210 closers
- Non-hold open arm, specify closer x **A3**
- Hold open arm, specify closer x **A2***. Hold-open range 85° to 110°

689F03
(Non-Hold Open)

689F04
(Hold Open)

Heavy-Duty Reversible Backstop Parallel Arm

- Recommended for high-use, high-abuse environments
- Tamper-resistant, solid forged steel riveted arm (mounted on push side)
- Field-reversible steel lug restricts degree of opening to protect door, wall and hardware
- Requires both backcheck valves on closer
- Shipped standard as left hand. Handing can be reversed in the field
- Optional on DC3210 closers
- Non-hold open arm, specify closer x **A4**. Door stop range 85° to 110°
- Hold open arm, specify closer x **A5***. Door stop/hold open range 85° to 110°

***Not allowed by code on fire doors.**

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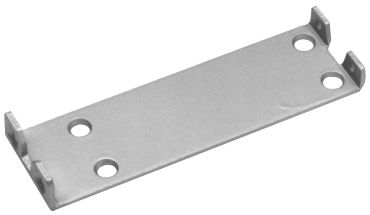
Mounting Brackets

DC3000 Series

188F03



Quik-Install™ Mounting Bracket

- Standard on all closers
- Reduces installation time
- Ensures correct mounting
- Bracket is first mounted to door or frame, then closer is attached
- Bracket size: 1-3/4" (44mm) (vertical) x 6" (152mm) (horizontal)
- Hole spacing: 1" (25mm) (vertical) x 4-5/16" (110mm) (horizontal)

244F17

Mortise Arm Bracket for Regular Arm Mounting

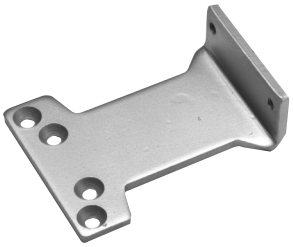
- For regular arm mounting where frame requires reinforcement, i.e., on frames with bull nose trim
- Specify closer x M84

188F41

Parallel Arm Non-Hold Open Bracket

- Converts regular arm to parallel arm closer
- Standard with parallel arm mounting
- Packed with five screws and 691F78 spacer

509F49



Parallel Arm Hold Open Bracket

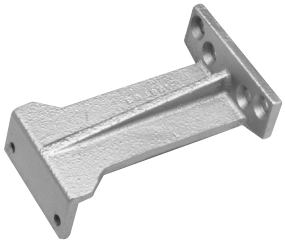
- Converts regular arm hold open to parallel arm hold open closer
- Standard with parallel arm hold open mounting

188F62

Parallel Arm Offset Bracket

- Required when parallel arm is used in conjunction with an overhead door holder
- Specify closer x M83

188F63



Parallel Arm Flush Transom Bracket

- Required when parallel arm mounting is used on a flush transom application
- Specify closer x M82

Specify finish when ordering parts.

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Brackets and Covers

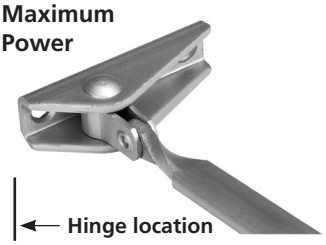
DC3000 Series

Drop Plate (Option M80)

Permits parallel arm or top jamb mounting on door when top rail is too narrow to install closer in the regular manner. Minimum 2" top rail required. Optional on DC3000 series closers; see Quick Codes, page 13. To order separately, specify drop plate number x Finish

Closer Series	Drop Plates
	Full Cover
DC3210	597F58
DC3220	188F65

Maximum Power

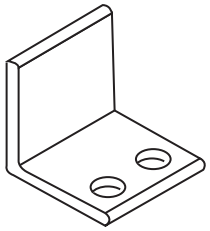


Normal Power

Power Adjustment Arm Bracket

Standard on all closers without hold open. In regular arm or top jamb mounting, bracket may be reversed to increase closing power 15%.

447F14



Angle Support Bracket and Spacer

- Available separately for mounting of A2, A3, A4 and A5 heavy-duty arms on narrow frame or soffit conditions
- Specify closer x M85

597F78

Full Cover

- Standard on all DC3000 series door closers
- Completely covers closer body
- Non-handed
- Dimensions: 11-5/8" (295mm) x 3" (76mm) x 2-3/4" (70mm) deep

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Size and Handing

DC3000 Series

Factors in Determining Closer Size

1 - Weight and Height of Door

Doors vary in weight from light hollow-core wood doors to heavy metal doors. Door sizes listed in the chart are based on doors of standard weight and height. Extra-light or extra-heavy weight or unusual height must be compensated for. **Contact factory if door weight exceeds 250 lbs.**

2 - Draft and Wind Conditions

Draft and wind conditions are perhaps the most important factors to consider in determining the closer size required. Sizes listed in the chart apply to normal conditions. Stairwells, air conditioning, building construction, and door location can cause strong draft and wind conditions; these may necessitate adjusting spring power to a larger size or using a closer one size larger.

3 - Code Compliance

A multi-sized, fully adjustable closer such as the DC3200 closer provides the greatest flexibility in balancing barrier-free access, security and life safety codes. However, when a manual closer is installed and adjusted to comply with ADA or any other reduced opening force requirements, it may no longer have sufficient power to close and latch the door reliably.

Recommended Door Closer Sizes

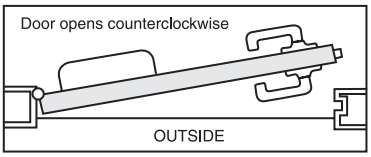
Mounting	Size Of Door			Recommended Closer Size Adjusted
	Interior	Exterior In-swinging	Exterior, Out-swinging	
Regular or Top Jamb	2'4"	–	–	1
	3'0"	–	–	2
	3'6'	2'6"	3'0"	3
	4'0"	3'0"	3'6"	4
	4'6"	3'6"	4'0"	5
	5'0"	4'0"	4'6"	6
Parallel Arm	2'4"	–	–	1
	2'6"	–	–	2
	3'0'	–	2'6"	3
	3'6"	–	3'0"	4
	4'0"	–	3'6"	5
	4'6"	–	4'0"	6

Handing

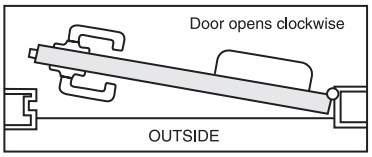
Refers to the direction a door swings; always determined from the outside of the door.

Regular Mounting

Door: left hand
Closer: left hand pull side

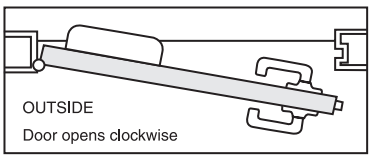


Door: right hand
Closer: right hand pull side

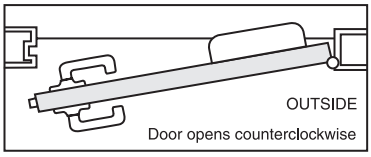


Parallel Arm Mounting

Door: left hand reverse bevel
Closer: right hand push side

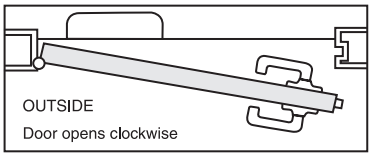


Door: right hand reverse bevel
Closer: left hand push side

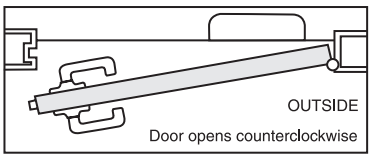


Top Jamb Mounting

Door: left hand reverse bevel
Closer: right hand push side



Door: right hand reverse bevel
Closer: left hand push side



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How to Order

DC3000 Series

ANSI/BHMA A156.4 Certified Closer Cross Reference

ANSI/BHMA Number	Function	Series	PT 4A 15% Power Adjustment	PT 4B 35% Power Adjustment	PT 4C 50% Power Adjustment	PT 4D Adjustable Backcheck	PT 4F Delayed Action PT	4G Dead Stop PT	4H Fully Adjustable
CO2011 (PT1)	Hinge Side Mounting	DC3200	S	S	S	S	O	N/A	S
CO2051 (PT1)	Hinge Side Mounting Holder Arm	DC3200-A1	S	S	S	S	O	N/A	S
CO2021 (PT1)	Parallel Arm Mounting	DC3210	S	S	S	S	O	O	S
CO2061 (PT1)	Parallel Arm Mounting Holder Arm	DC3210-A1	S	S	S	S	O	O	S
CO2041 (PT1)	Top Jamb Mounting	DC3220	S	S	S	S	O	N/A	S
CO2081 (PT1)	Top Jamb Mounting Holder Arm	DC3220-A1	S	S	S	S	O	N/A	S
CO2191 (PT1)	Drop Plate for Frames or Narrow Top Rail Doors	DC3220 w/ 188F65	S	S	S	S	O	N/A	S
CO2201 (PT1)	Drop Plate for Parallel Arm Mounting on Narrow Top Rail Doors	DC3210 w/ 188F65 or 597F58	S	S	S	S	O	O	S

ANSI Performance Requirements: (PT 1)- 2,000,000 cycles
N/A = not available S = standard O = option available

Ordering Examples

Stock Order		
Quantity	Series	Finish
50	DC3200	689

Contract Order						
Quantity	Series	Arm	Finish	Hand	Door Thickness	Misc. Options
150	DC3220	A1	690	RH	D138	M54

NOTE:
- Before installing a door closer, verify the accessibility, fire, and life-safety requirements that are in effect. This includes the mounting height and projection into the clear opening. Check the adopted state and local building codes and consult the Authority Having Jurisdiction (AHJ).
- To maintain the warranty and ensure proper operation of the product, follow the installation instructions & templates and install on the inside of the building.
- Consult NFPA 80 for the hinge requirements on a fire door.
- Failure to use fasteners supplied with closer may void factory warranty.
- Optional fasteners are available for a variety of applications. Consult the door and frame manufacturer to ensure the proper fasteners are used to maintain certifications.
- Sizing charts are based on 1-3/4" x 7' standard weight doors swinging to 110°. Other application conditions (e.g. larger door heights or weight) may require larger size closer. Adjusting the spring power to meet the low opening force requirements of the Americans With Disabilities Act or ANSI/BHMA Standard A117.1, may not provide adequate closing power to dependably close and latch the door in some conditions (i.e. air movement from wind gusts or building stack pressure).

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Quick Codes

DC3000 Series

Series/Mounting/Size		
Description	**Mounting**	**Specify**
DC3200 Closers Multi-sized; full adjustability from size 1-6	Regular Arm	DC3200
	Parallel Arm	DC3210
	Top Jamb	DC3220

Arm	
Description	**Specify**
Regular non-hold open	(standard)
Hold open	A1*
Heavy-duty parallel with hold open	A2*
Heavy-duty parallel non-hold open	A3
Heavy-duty backstop non-hold open	A4
Heavy-duty backstop with hold open	A5*
Heavy-duty regular non-hold open	A10

*** Hold Open arms cannot be used on fire doors.**

Handing	
Hand	**Specify**
Right Hand/Left Hand Reverse	RH
Left Hand/Right Hand Reverse	LH

Finish		
Description		**Specify**
USP	Primed for Painting	600
N/A	Dark Oxidized Satin Bronze - equivalent	613E
SBL	Silver Aluminum Painted	689
DBL	Dark Bronze Painted	690
LBL	Light Bronze Painted	691
FBL	Black Painted	693
GBL	Satin Brass Painted	696
BSP	Black Suede Powder Coat	BSP
WSP	White Suede Powder Coat	WSP

Door Thickness	
Door Thickness	**Specify**
1-3/4" (44mm)	(standard)
2" (51mm)	D200
2-1/4" (57mm)	D214

Miscellaneous Options	
Description	**Specify**
Sex nuts and bolts (SNBs) (1-3/4" minimum thickness)	M54
Delayed action	M71
Full cover	(standard)
Corrosion protection	M75
Heavy-duty parallel arm flush transom bracket (499F30) used with A2, A3, A4, A5 arms	M79
Parallel arm flush transom bracket (parallel or A1)	M82
Parallel arm offset bracket	M83
Mortise arm bracket (for regular arm mounting)	M84
Angle support bracket	M85
Extreme temperature fluid	(standard)

Drop Plates - order by number (formerly M80)	
Closer Series	**Drop Plate**
DC3210 (parallel)	597F58
DC3220 (top jamb)	188F65

Paint (cans)	
Description	**Specify**
Silver Aluminum	597F94
Dark Bronze	597F95
Light Bronze	597F96
Satin Brass	597F97

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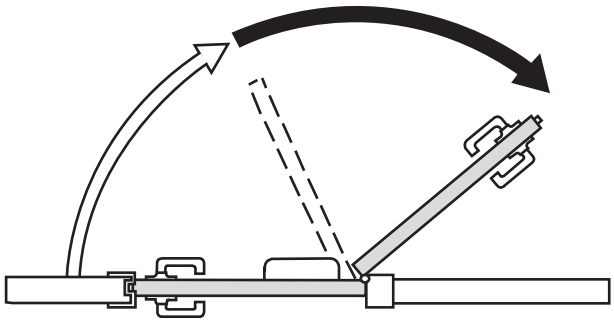
Helpful Terms

DC3000 Series

Arm
The linkage of a closer that connects the body to the door or frame.

Backcheck
Slows a door during the opening cycle, by providing cushioned resistance to a forceful opening. Designed to protect people and objects behind the door and to prevent damage to the closer, hardware, and wall. Intensity can be increased or decreased. Not intended to act as a stop.



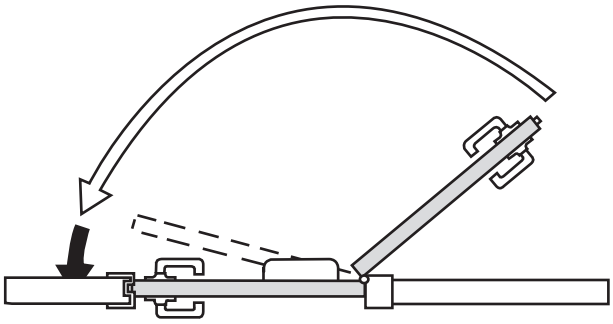
Closing Speed
The speed at which a door swings from the open position to within a few degrees of latching. See Latching Speed.

Corrosion Protection
Additional painted covering on all external parts to deter oxidation and corrosion.

Door Stop
A device to stop the swing of a door.

Hold Open
Maintains door at a particular degree of opening. A mechanical hold open may not be used on labeled fire doors, which must be self-closing.

Latching Speed
The speed of the door during the last few degrees of closing. Allows latching and prevents slamming.



Mounting
The method by which a closer is attached to the door and frame.

Multi-Sized Closer
A closer whose spring tube design allows full adjustment of the spring power size from 1 through 6.

Quik-Install™ Mounting Bracket
Unique bracket that simplifies installation and minimizes installer fatigue.

Sex Nuts and Bolts (SNBs)
Thru-bolts required for all non-steel-reinforced fire doors, and recommended for non-reinforced wood and mineral core doors.

Spring Power
A measurement of closing force, or the ability to overcome draft, air pressure, weight or other resistance to door closing.

Star Punch
An eight-sided socket hole in the closer arm, permitting spindle pre-loading. Provides full functioning of backcheck and delayed action valves, and additional closing force, on parallel arm mountings.

Universal Mounting
The ability of a closer to accommodate either hand of door for regular, top jamb or parallel arm mounting.

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How to Specify

DC3000 Series

Suggested Specifications

All door closers shall be DC3000 Series Door Closers as manufactured by Corbin Russwin Architectural Hardware.

Closers shall be of rack and pinion construction with a triple heat treated cold-formed steel spindle and a steel piston, heat treated and precision machined. Cases shall be of cast iron with a one-piece seamless forged spring tube. A two-piece or seamed spring tube shall not be acceptable. Springs shall be double heat treated and tempered. Closers shall have a heavy-duty, forged steel main arm.

Optional arms shall include parallel, hold open, heavy-duty, heavy-duty hold open, heavy-duty reversible backstop and heavy-duty reversible backstop with hold open.

Closers shall be multi-sized with adjustable spring power to accommodate sizes 1 through 6 in one closer body, such as the Corbin Russwin DC3200 closer. Closing shall be controlled by two valves - one to control closing speed and one to control latching speed. Valves shall be concealed against unauthorized adjustment and shall be non-critical with "O" rings.

Closers shall be available with an adjustable backcheck intensity valve. Delayed action shall be available and accomplished with a separate valve. Valves shall be accessible without removing the closer from the door.

Closers shall be surface applied with rectangular cover, and shall be devoid of manufacturer's trademarks.

Closers shall not project over 2-3/4", and shall be capable of mounting on a 1-3/4" top rail (or top jamb for inverted mounting). Full cover shall be standard. Non-hold open closers shall be regularly furnished with a power adjustment arm bracket capable of providing a 15% power adjustment. A Quik-Install™ mounting bracket to attach the closer shall be regularly furnished. High lubricity hydraulic fluid shall be furnished. Closers mounted top jamb and parallel arm shall allow for full 180° door opening.

Closers shall be listed by Underwriters' Laboratories for closers with non-hold open arms.

Certification:
ANSI/BHMA A156.4, Grade 1
UL10C positive pressure up to 3 hours
UL-cUL
ICC/ANSI A117.1

Closers shall carry a 15-year limited warranty.

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The ASSA ABLOY Group is the global leader in access solutions. Every day, we help billions of people experience a more open world.

ASSA ABLOY Opening Solutions leads the development within door openings and products for access solutions in homes, businesses and institutions. Our offering includes doors, frames, door and window hardware, mechanical and smart locks, access control and service.

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For additional information, contact your ASSA ABLOY Door Security Solutions sales consultant or visit **www.corbinrusswin.com.**

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Berlin, CT 06037
Phone: 800-543-3658
Fax: 800-447-6714
www.corbinrusswin.com

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Corbin Russwin

ASSA ABLOY

CL3800 Series

Standard-Duty Key-in-Lever Locksets

Product Catalog

Experience a safer
and more open world

Corbin Russwin
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CL3800 Series

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MicroShield®
ASSA ABLOY Group companies offer MicroShield®, an anti-microbial coating for door hardware. MicroShield uses proven silver ion-based technology from Agion®, a leading provider of antimicrobial solutions, to stem the spread of bacteria and other microbes.

MicroShield® is a trademark of ASSA ABLOY Access and Egress Hardware Group, Inc.

MicroShield® Coating

- Revolutionary finish coating available on all Corbin Russwin product lines, utilizes a silver-based antimicrobial compound from Agion Technologies
- As an integral part of the finish coating, MicroShield lasts for the life of the hardware
- MicroShield coating permanently suppresses the growth of bacteria, algae, fungus, mold and mildew. It is effective against a broad spectrum of bacteria.
- Non-toxic and completely safe. The Agion antimicrobial compound is EPA and NSF approved and FDA listed for use in medical and food preparation equipment.
- Applications: Anywhere there is need for a clean environment (hospitals, laboratories, schools, medical centers, daycare, food processing etc.)

agion Nature's antimicrobial

The Agion antimicrobial is not intended as a substitute for good hygiene. Coated products must still be cleaned to ensure the surfaces will be free of destructive microbes. ASSA ABLOY makes no representations or warranties, express or implied, as to the efficacy of the Agion antimicrobial. A copy of the Agion warranty is available upon request. Agion is a registered trademark of Agion Technologies, Inc., Wakefield, MA, USA.

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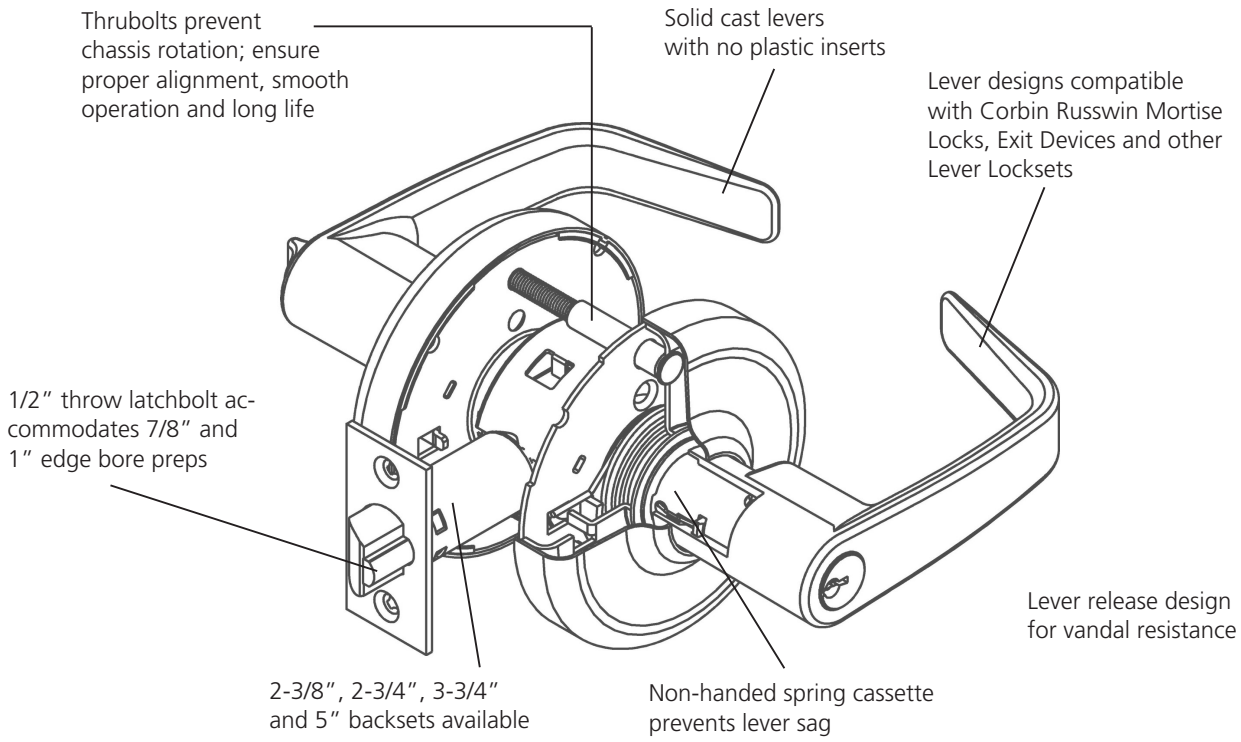
Overview

CL3800 Series

An economical, Grade 2 standard-duty lever lockset which provides an outstanding combination of value and performance. It's the ideal lever lockset for standard commercial applications. When used in conjunction with the CLX3300 Series Extra Heavy-Duty Grade 1 Cylindrical Lever Locksets, the overall cost of many projects may be reduced without compromising functionality and durability.



Applications

- Interior offices
- Closets
- Multi-family housing
- Restaurants
- Retail complexes

Hurricane

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Certifications

CL3800 Series

Certification/Compliance

ANSI/BHMA	Certified ANSI/BHMA A156.2 (2017) Series 4000 — Grade 2 Certified ANSI/BHMA A156.41
UL/cUL	UL/cUL listed to US and Canadian safety standards for 3 hour doors up to 4' x 10'
NFPA 80	Conforms for life safety and property protection, Standard for Fire Doors and Other Opening Protectives
Positive Pressure	Meets ANSI/UL 10C, Positive Pressure Fire Test of Door Assemblies
ADA	All levers conform to ADA clear opening width requirements of ANSI A117.1
California State Reference Code (Formerly Title 19, California State Fire Marshal Standard)	All levers with returns comply; levers return to within 1/2" (13mm) of door face
Windstorm/Hurricane	All individual components of a total door opening are required to comply with each code. Refer to the Corbin Russwin Website (www.corbinrusswin.com) for specific code compliance listings for both the lock hardware and other door components.

Any retrofit or other field modification to a fire rated opening can potentially impact the fire rating of the opening, and Corbin Russwin makes no representations or warranties concerning what such impact may be in any specific situation. When retrofitting any portion of an existing fire rated opening, or specifying and installing a new fire-rated opening, please consult with a code specialist or local code official (Authority Having Jurisdiction) to ensure compliance with all applicable codes and ratings.

Windstorm Certifications: Florida Building Codes & UL Listings

Corbin Russwin products meet building codes that require hurricane and windstorm certifications, including some of the most stringent building codes as specified in the Florida Building Code, Miami Dade Code and the International Building Code. Listed below are certifications and standards met by the CL3800 Series locks.

Florida Building Code: FL3067
UL Certification Directory: ZHEM.R21836 – Latching Hardware

ANSI/SDI A250.13 (2014)	"Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies"
ASTM E330 (2002)	"Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference"*
ASTM E1886 (2005)	"Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials"*
ASTM E1996 (2009)	"Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes"*
(TAS) 201 (1994)	"Impact Test Procedures"*
(TAS) 202 (1994)	"Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference"*
(TAS) 203 (1994)	"Criteria for Testing Products Subject to Cyclic Wind Pressure Loading"*

* Published in the 7th Edition (2020), "Florida Building Code" (FBC), State Product Approval Number FL3067

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Technical Details

CL3800 Series

Door Prep	ANSI/BHMA A156.115
Door Thickness	Standard 1-3/8" to 1-7/8" (35 to 48mm); factory set for 1-3/4" doors For 2" (51mm) up to 2-1/4" (57mm), specify Quick Code D214
Minimum Stile	4-1/2" (114mm)
Handing	Non-handed
Backset	2-3/4" (70mm) backset w/ 1-1/8" front (standard) 2-3/8" (60mm) backset w/ 1" wide front (specify Quick Code B238) 3-3/4" (95mm) backset w/ 1-1/8" front (specify Quick Code B334) 5" (127mm) backset w/ 1-1/8" front (specify Quick Code B500)
Latchbolt	Stainless steel, 1/2" (13mm) throw
Front	Wrought brass, bronze, or stainless steel Optional: rounded corners (specify Quick Code M13) 2-1/4" x 1-1/8" (57mm x 29mm) standard for 2-3/4" (70mm), 3-3/4" (95mm) and 5" (127mm) backset 2-1/4" x 1" (57mm x 25mm) standard for 2-3/8" (60mm) backset Accommodates flat doors and doors beveled 1/8" in 2" (3mm in 51mm)
Strike	Wrought brass or stainless steel ANSI curved lip standard, 4-7/8" (124mm) x 1-1/4" (32mm) x 1-1/4" (32mm) lip to center Optional strikes, lip lengths and ANSI wrought strike box available; see page 11
Cylinder	Brass, 6-pin L4 keyway, 0-bitted standard, see Quick Codes page 12
Keys	Two nickel silver change keys per lock standard
Masterkeying	Can be master keyed or grand master keyed Construction key systems available
Tactile Levers	Knurling (etching) or abrasive coating (surface tape) applied to backside of levers (see Quick Codes page 13)
Finishes	See page 20
Warranty	Five-year limited

Advantages

- Independent return springs allow lock to exceed ANSI/BHMA A156.2 Grade 2 cycle requirements without lever sag
- Thrubolted for solid attachment
- High Security and security key systems available (Access 3, Pyramid, etc.)
- Lever Release freewheeling levers standard for vandal resistance
- 14 finishes plus MicroShield® antimicrobial options
- Solid cast levers with multiple options including decorative designs

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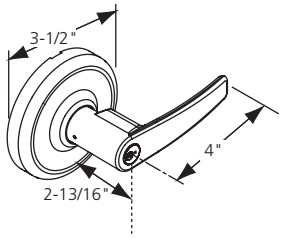
Trim Designs

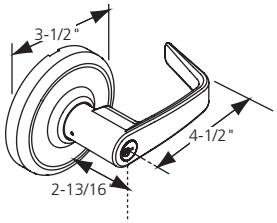
CL3800 Series

Levers - Solid Cast Zinc

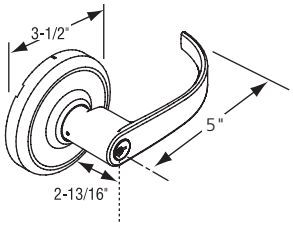
Armstrong
AZ



Newport
NZ

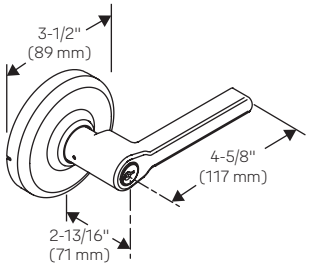


Princeton
PZ

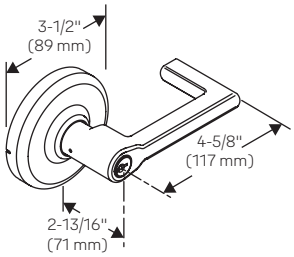


Decorative Levers

102

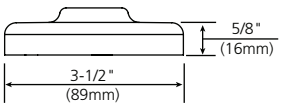


124*



Rose
Wrought Brass

D



*Complies with codes requiring lever to return to within 1/2" (13mm) of door face.

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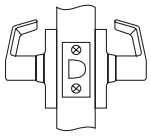
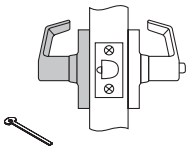
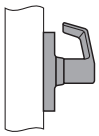
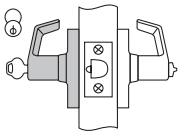
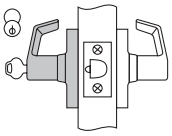
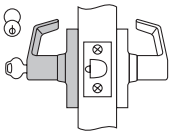
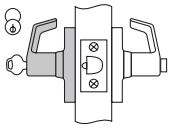
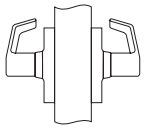
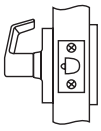
Functions

CL3800 Series

Outside Inside	Series/Function	Type	ANSI No.	Function Description
	CL3810	Passage or Closet	F75	• Latchbolt by lever either side • Both levers always free.
	CL3820	Privacy Bedroom or Bathroom	F76A	• Throw-off latchbolt by lever either side, except when push button locks outside lever. • Outside lever locked by push button. (Lever handle is free-wheeling in locked position.) • Outside lever unlocked by emergency release tool, by rotating inside lever or by closing door. • Inside lever always free.
	CL3850	Half Dummy Trim	—	• Lever acts as pull only; no operation. • Lever is rigid.
	CL3851	Entrance or Office	F109	• Deadlocking latchbolt by lever either side except when turn button locks outside lever. (Lever handle is free-wheeling in locked position). Pushing turn button locks outside lever, requiring use of key outside to unlock. • Turning inside lever unlocks outside lever. • Pushing in and turning button locks outside lever, requiring key at all times. Turning inside lever does not unlock outside lever until button is manually turned to unlocked position. • Inside lever always free.
	CL3855	Classroom	F84	• Deadlocking latchbolt by lever either side except when key outside locks outside lever. (Lever handle is free-wheeling in locked position.) • Outside lever unlocked by key outside. • Inside lever always free.
	CL3857	Storeroom or Closet	F86	• Deadlocking latchbolt by key in outside lever or by rotating inside lever. • Outside lever always locked (lever handle is free-wheeling in locked position). • Inside lever always free.
	CL3861	Entry or Office	F82A	• Deadlocking latchbolt by lever either side, except when push button locks outside lever. • Push button released by turning inside lever or by key in outside lever. (Lever handle is free-wheeling in locked position.) • Closing door does not release push button. • Inside lever always free.
	CL3870	Full Dummy Trim	—	• Levers act as pulls only; no operation. • Levers are rigid.
	CL3880	Passage Lever x Blank Plate	F111	• Deadlocking latchbolt by lever. • Lever on one side; blank plate on the other. • Lever always free. • For single or double communicating doors.

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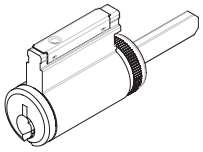
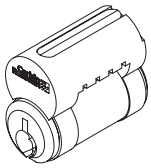
Cylinders

CL3800 Series

Corbin Russwin Cylinders



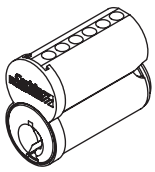


Security Type	Pins	Standard Cylinder	Large Format Interchangeable Core
Conventional	6-pin	CR2000-033 (standard)	CR8000
	7-pin	CR2000-033-7	CR8000-7
Security	6-pin	CR2010-033	CR8010
Pyramid High Security	7-pin	CR2020-033	CR8020
Pyramid Security	7-pin	CR2027-033	CR8027
Access 3® AP	6-pin	CR2500-033	CR8500
Access 3® AS	6-pin	CR2600-033	CR8600
Access 3® AHS	6-pin	CR2700-033	CR8700

Plug diameter for standard cylinders is .509, .510 for Access 3®, .552 for security cylinders and .496 for Pyramid cylinders.
Cylinders are brass and come with 2 nickel silver keys.
Finishes for all cylinders and cores include 606, 626 or BSP.
To order cylinders separately, specify Part No. x Keyway x Finish (e.g., CR2000-033 x L4 x 626).

Small Format Interchangeable Core

Description	Number
6-pin	CR8200
7-pin	CR8200-7



Cores are available in Best® keyways A, B, C, D, E, F, G, H, J, K, L, M.
Cores are brass and come with 2 nickel silver keys.
Finishes: 606, 626

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Cylinders with Keyways From Other Manufacturers*

Competitive Keyway	Number
Schlage® C (0-bitted)	CR2400-033-C
Schlage® C (keyed random)	CR2400-033-C-KR
SARGENT® LA (0-bitted)	CR2400-033-LA

*All cylinders are 6-pin and available in 606 or 626 finish.

Levers That Accept Competitive Interchangeable Core Cylinders*

Cylinder Type	Quick Code	Tailpiece Pack Only
SFIC 6 or 7-pin (all designs)	M08 Tailpiece included	682F958
Schlage® 6-pin LFIC (NZ, PZ only)	M69 Tailpiece included	697F942

*Core not included.

Adapters Required to Accept Competitive Cylinders*

Competitive Cylinder	Quick Code	Tailpiece Pack Only
Schlage® fixed core Conventional (21-002, 23-001, 23-013) or Primus® (20-548, 20-550, 20-748, 20-750)	M06 Tailpiece included	682F398
SARGENT® fixed core C10-1	M09 Tailpiece and special lever included	682F969

*Cylinder not included.

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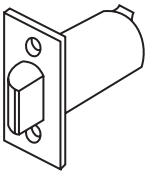
CL3800 Series

Latches

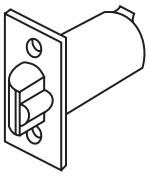
To order optional latchbolt with lockset, see How to Order, page 9.
To order latchbolt separately, specify Part No. x Finish (e.g., 599F91 x 626).

Backset and Front Description		Plain	Deadlocking	Throw-Off
2-3/8" Backset	1" width, square corner	599F91	599F92	599F93
	1" width, rounded corner	599F94	599F95	599F96
	1-1/8" width, square corner	599F97	599F98	599F99
	1-1/8" width, rounded corner	600F00	600F01	600F02
2-3/4" Backset	1" width, square corner	600F03	600F04	600F05
	1" width, rounded corner	600F06	600F07	600F08
	1-1/8" width, square corner (std)	600F09	600F10	600F11
	1-1/8" width, rounded corner	600F12	600F13	600F14
3-3/4" Backset	1-1/8" width, square corner	600F62	600F63	600F64
	1-1/8" width, rounded corner	600F65	600F66	600F67
5" Backset	1-1/8" width, square corner	600F68	600F69	600F70
	1-1/8" width, rounded corner	600F71	600F72	600F73

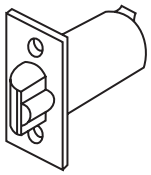
Housing diameter 7/8" for all models. 1" diameter latch sleeve furnished with each latchbolt.



Plain
(CL3810)



Deadlocking
(All other functions)



Throw-Off
(CL3820)

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Strikes

ANSI Curved Lip (standard)

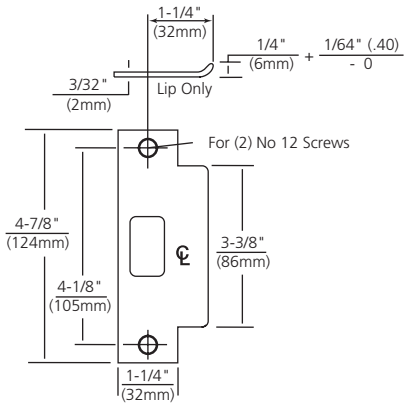
Brass or stainless steel.

4-7/8" (124mm) x 1-1/4" (32mm) x 1-1/4" (32mm) lip to center.

Optional lip lengths:
1" (25mm), 1-1/8" (29mm), 1-3/8" (35mm), 1-1/2" (38mm), 1-3/4" (44mm), 2" (51mm), 2-1/4" (57mm), 2-1/2" (64mm), 2-3/4" (70mm), 3" (76mm).

To order with lockset, see Quick Codes below.

To order separately, specify 217L13 x Lip Length x Finish.



Curved Lip "T" Strike

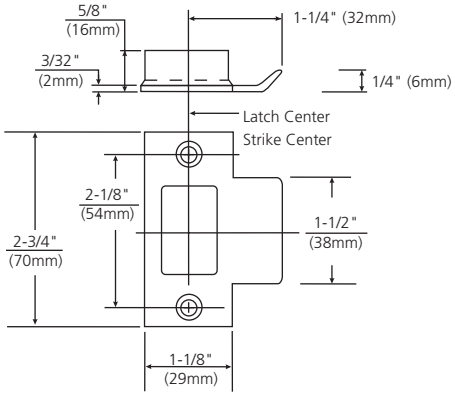
Brass.

2-3/4" (70mm) x 1-1/8" (29mm) x 1-1/4" (32mm) lip to center.

Optional lip lengths: 1" (25mm), 1-1/8" (29mm), 1-3/8" (35mm), 1-1/2" (38mm), 1-3/4" (44mm), 2" (51mm), 2-1/4" (57mm), 2-1/2" (64mm), 2-3/4" (70mm), 3" (76mm).

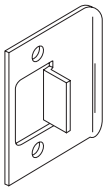
To order with lockset, see Quick Codes below.

To order separately, specify 586L19 x Lip Length x Finish.



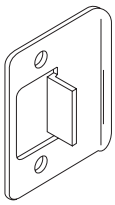
Full Lip Strike

- Brass or stainless steel.
- 2-1/4" x 1-3/4" x 1-1/4" lip to center.
- No optional lip lengths.
- To order with lockset, see Quick Codes.
- To order separately specify 680L50M020 x Finish.
- Anti-rattle tab.



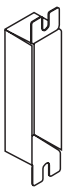
Full Lip Strike – 1/4" Radius Corners

- Brass or stainless steel.
- Similar in dimension and function to L50 strike (above) but with radius corners for easy mortising by power tools.
- To order with lockset, see Quick Codes.
- To order separately specify 680L51M020 x Finish.
- Anti-rattle tab.



ANSI Wrought Strike Box

- Used with ANSI 4-7/8" (124mm) strike.
- To order with lockset, specify quick code found on page 13. To order separately, specify 120F768.



ANSI Lip to Center	ANSI Curved Lip Specify	Curved Lip Box Specify	Full Lip Specify	Full Lip Radius Corner Specify
1" (25mm)	SA100	SC100	N/A	N/A
1-1/8" (29mm)	SA118	SC118	N/A	N/A
1-1/4" (32mm)	SA114 (standard)	SC114	SF114	SFR114
1-3/8" (35mm)	SA138	SC138	N/A	N/A
1-1/2" (38mm)	SA112	SC112	N/A	N/A
1-3/4" (44mm)	SA134	SC134	N/A	N/A
2" (51mm)	SA200	SC200	N/A	N/A
2-1/4" (57mm)	SA214	SC214	N/A	N/A
2-1/2" (64mm)	SA212	SC212	N/A	N/A
2-3/4" (70mm)	SA234	SC234	N/A	N/A
3" (76mm)	SA300	SC300	N/A	N/A

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Quick Codes

CL3800 Series

Cylinder and Keying

Description	Specify
Conventional 6-pin	(standard)
Conventional 7-pin	7P
Less Cylinder(s)	LC
LFIC	
LFIC 6-pin	C6
LFIC 6-pin Less Core	CL6
LFIC 6-pin Disposable Core	CT6D
LFIC 6-pin with Temporary Construction Core (Red)	CT6R
LFIC 6-pin with Temporary Construction Core (Blue)	CT6B
LFIC 6-pin with Temporary Construction Core (Green)	CT6G
LFIC 7-pin	C7
LFIC 7-pin Less Core	CL7
LFIC 7-pin Disposable Core	CT7D
LFIC 7-pin with Temporary Construction Core (Red)	CT7R
LFIC 7-pin with Temporary Construction Core (Blue)	CT7B
LFIC 7-pin with Temporary Construction Core (Green)	CT7G
SFIC	
SFIC 6-pin	C6S
SFIC 6- or 7-pin Small Format Disposable Core	CTSD
SFIC 6-pin with Temporary Construction Core (Blue)	CT6SB
SFIC 7-pin	C7S
SFIC 7-pin with Temporary Construction Core (Blue)	CT7SB
Security	
Security	HS
Security LFIC	CHS
Access 3®	
Access 3® Patented Fixed Core	AP
Access 3® Security Fixed Core	AS
Access 3® High Security Fixed Core	AHS
Access 3® Patented LFIC	ACP
Access 3® Security LFIC	ACS
Access 3® High Security LFIC	ACHS
Pyramid	
Pyramid Security Fixed Core	PS
Pyramid High Security Fixed Core	PHS
Pyramid Security LFIC	PCS
Pyramid High Security LFIC	PCHS
Pyramid LFIC Less Core	CLP
Pyramid with Temporary Construction Core	CTP
Pyramid Disposable Core	CTPD
Keying and Keys	
0-bitted with 2 blank keys	(standard)
Keyed Random	KR
Construction Master Keyed	CMK
2 keys per lock	(standard)
More than 2 keys	KY# (e.g., KY6)

Cylinder and Keying (cont.)

Description	Specify
Visual key control (VKC)	
No bitting or keyset stamping on keys	VKC0
Keys only	VKC1
Cylinders and keys (not for AS, AHS, ACS, ACHS, HS, CHS, PHS or PCHS)	VKC2
Cylinders only (not for AS, AHS, ACS, ACHS, HS, CHS, PHS or PCHS)	VKC3
Concealed key control (CKC)	
CKC cylinders with VKC keys	CKC2
CKC cylinders only (not for AS, AHS, ACS, ACHS, PHS, PCHS)	CKC3
Schlage® C keyway cylinder (0-Bitted or KR)	C
SARGENT® LA keyway cylinder (0-Bitted)	LA

Door Thickness

Door Thickness	Specify
1-3/8" (35mm) - 1-7/8" (48mm)	(standard)
2" (51mm) - 2-1/4" (57mm)	D214

Backset

Description	Specify
2-3/8" (60mm)	B238
2-3/4" (70mm)	(standard)
3-3/4" (95mm)	B334
5" (127mm)	B500

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Quick Codes

CL3800 Series

Miscellaneous Options

Description	Specify
Spanner head screws	M02
Torx® head screws	M04
Less cylinder, with tailpiece for Schlage® fixed core cylinder (all designs)	M06
Lever to accept SFIC 6 or 7-pin interchangeable core (all designs)	M08
Lever to accept SARGENT® cylinder (NZD & PZD designs only)	M09
Lever to accept Schlage® Interchangeable core (NZD & PZD design only)	M69
Rounded corners on latch front	M13
1" latch front, square corners (standard for 2-3/8" backset)	M14
1" latch front, rounded corners	M15
ANSI wrought strike box	M17
Knurling outside and inside	M20*
Knurling outside only	M21*
Knurling inside only	M22*
Abrasive coat outside and inside	M23
Abrasive coat inside only	M24
Abrasive coat outside only	M25
1-1/8" front, square corners (standard for 2-3/4", 3-3/4"and 5" backsets)	M32

*All levers provided in a powder coat finish will be supplied with an abrasive coating

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Finishes

CL3800 Series

Finishes

Description		Specify
ANSI/BHMA 605 (US3)	Bright Brass	605
ANSI/BHMA 606 (US4)	Satin Brass	606
ANSI/BHMA 611 (US9)	Bright Bronze	611
ANSI/BHMA 612 (US10)	Satin Bronze	612
ANSI/BHMA 613 (US10B)	Dark Oxidized Satin Bronze, Oil Rubbed	613
613E	Dark Oxidized Satin Bronze - equivalent	613E
613L	Dark Oxidized Satin Bronze, Clear Coated	613L
ANSI/BHMA 618 (US14)	Bright Nickel Plated	618
ANSI/BHMA 619 (US15)	Satin Nickel Plated	619
619C	Satin Nickel Plated with MicroShield®	619C
ANSI/BHMA 625 (US26)	Bright Chromium Plated	625
ANSI/BHMA 626 (US26D)	Satin Chromium Plated	626
626C	Satin Chromium Plated with MicroShield®	626C
722	Black Oxidized Bronze, Oil Rubbed	722
BSP	Black Suede Powder Coat	BSP
WSP	White Suede Powder Coat	WSP

Zinc levers are plated to match ANSI/BHMA finish.

Lock/Cylinder Finish

Lock	Cylinder/Core*
605, 606, 611, 612, 613, 613E, 613L, 722	606
618, 619, 625, 626, WSP	626
BSP	BSP

*Finish when cylinder provided with lock

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Ordering Examples

Stock Order

Quantity	Series/Function	Trim	Finish	Hand
100	CL3855	NZD	626	RHR

Split Trim / Finish Order

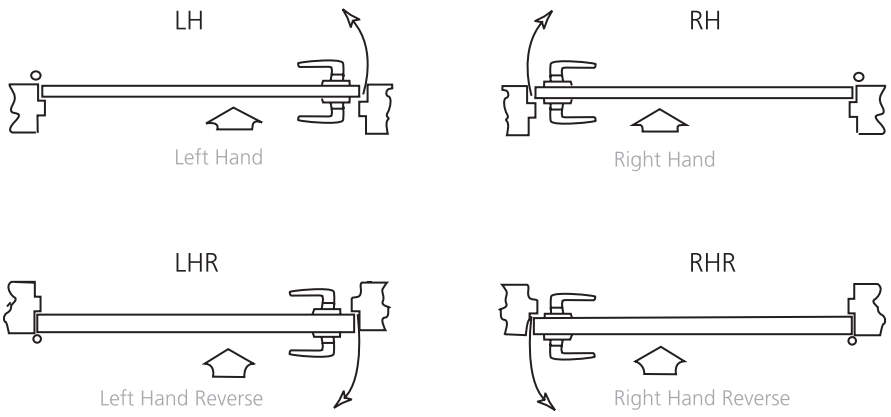
Quantity	Series/ Function	Trim		Finish		Hand
		Outside	Inside	Outside	Inside	
12	CL3855	NZD	AZD	626	625	RH

Contract / Detailed Order

Quantity	Series/ Function	Trim	Finish	Hand	Door Thickness	Backset	Optional Strike	Misc. Options	Optional Cylinder	Keying	Keyset
24	CL3855	NZD	626	RHR	D214	B238	SC114	M17	PHS	CKC2	AA1

How to Specify Handing:

Door hands determined from outside (secure side) of door.



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Specifications

CL3800 Series

Suggested Specification

Lockset chassis shall be constructed of heavy gauge steel and cast components, plated to protect against rust and corrosion. Locksets shall be adjustable for 1-3/8" (35mm) and 1-7/8" (48mm) or 2" (51mm) and 2-1/4" (57mm) door thickness.

Locksets shall be non-handed, and shall install easily without the need for specialized installation tools. Locksets shall have separate anti-rotation thrubolts in the 6 o'clock and 12 o'clock position outside the 2-1/8" face bore, and shall have no exposed mounting screws.

Locksets shall have solid one-piece, cast levers without plastic inserts, and shall be a minimum of 4" (102mm) in length. Levers shall operate independently, and shall have inside and outside lever return springs. Outside levers on the keyed locksets shall be removable only when the designated key is in the cylinder.

Vandal-resistant levers shall be offered as a standard feature in all locking functions and shall be free-wheeling in the locked condition. Locksets that are rigid in the locked condition, or must require resetting (breakaway) are not acceptable.

All locksets shall carry a five-year mechanical warranty.

All locksets shall comply with the following certifications:
- UL-cUL 3-Hour Fire Rating
- ANSI/BHMA A156.2 Series 4000, Grade 2
- ANSI/BHMA A117.1 Accessibility Code
- ANSI/BHMA A156.115 & A156.115W Preparations
- Windstorm/Hurricane (refer to local codes)

All locksets shall be CL3800 Series Grade 2 Key-in-Lever Cylindrical Locksets as manufactured by Corbin Russwin Architectural Hardware.

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Notes

CL3800 Series

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The ASSA ABLOY Group is the global leader in access solutions. Every day, we help billions of people experience a more open world.

ASSA ABLOY Opening Solutions leads the development within door openings and products for access solutions in homes, businesses and institutions. Our offering includes doors, frames, door and window hardware, mechanical and smart locks, access control and service.

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For additional information, contact your ASSA ABLOY Door Security Solutions sales consultant or visit **www.corbinrusswin.com.**

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Security Solutions Canada
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Vaughan, Ontario
Canada L4K 4T9
Phone: 800-461-3007
Fax: 800-461-8989
www.assaabloydss.ca

MicroShield®
ASSA ABLOY Group companies offer MicroShield®, an anti-microbial coating for door hardware. MicroShield uses proven silver ion-based technology from Agion®, a leading provider of antimicrobial solutions, to stem the spread of bacteria and other microbes.

MicroShield® is a trademark of ASSA ABLOY Access and Egress Hardware Group, Inc.

agion Nature's antimicrobial

The Agion antimicrobial is not intended as a substitute for good hygiene. Coated products must still be cleaned to ensure the surfaces will be free of destructive microbes. ASSA ABLOY makes no representations or warranties, express or implied, as to the efficacy of the Agion antimicrobial. A copy of the Agion warranty is available upon request. Agion is a registered trademark of Agion Technologies, Inc., Wakefield, MA, USA.

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236W
Concave Wall Stop

Notes:

- Specify 230T for machine screw and toggle nut screw pack (10 pk) for concrete
- BL236W is 236W case quantity 50
- Easy installation by inserting screwdriver through small hole in bumper
- Concave rubber bumper prevents damage to locksets with projecting buttons
- Concealed tamper proof mounting

PRODUCT SPECIFICATIONS

CERTIFICATION:
- Meets ANSI A156.16 for L02251

DIAMETER:
- 2-7/16" (75 mm)

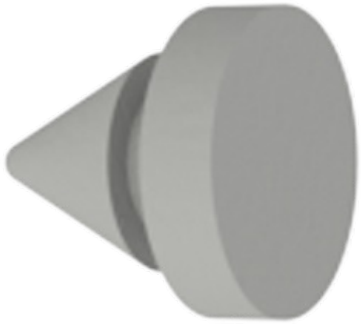
PROJECTION:
- 1" (25 mm)

MATERIALS:
- Wrought brass, bronze, stainless steel with grey rubber bumper

FINISHES:
- US3, US4, US10, US10B, US15, US15A, US19, US26, US26D, 32, 32D

FASTENER:
- One (1) #10 x 1-1/2" PPHWS with plastic and toggle anchor - for drywall

307D
Door Silencer



Certifications:

- For use with metal frames
- Proper installation eliminates door rattle and provides constant tension for door latches or locks

PRODUCT SPECIFICATIONS

BASE DIAMETER:
- 1/2" (12.5 mm)

PROJECTION:
- 1/8" (3 mm)

MATERIAL:
- Rubber

CERTIFICATIONS:
- Meets ANSI A156.16 for L03011

PRODUCT SIZE OPTIONS

307D QUANTITY BOX	307D QUANTITY CASE
10 each	100 each

283D
Manual Flush Bolt

Notes:

- 1-1/2 hour fire rating on wood doors up to 4 feet wide by 10 feet tall
- For use with wood composite/ fire rated doors
- Non-handed
- Bolt head rods are adjustable

PRODUCT SPECIFICATIONS

CERTIFICATIONS:
- Meets ANSI 156.16 for L14261

FACEPLATE:
- 1" x 6-25/32" (25 mm x 172 mm)

FLATTENED ROUND BOLT HEAD:
- 1/2" (13 mm)

BOLT THROW:
- 3/4" (19 mm)

BOLT BACKSET:
- 3/4" (19 mm)

GUIDE PLATE:
- 1" x 2-1/2"

MORTISE STRIKE:
- 15/16" x 2-1/4" (24 mm x 57 mm)

MATERIALS:
- Brass faceplate with steel components

FINISHES:
- US3, US4, US5, US9, US10, US10B, US15, US15A, US19, US26, US26D

FASTENERS:
- Eight (8) #8 x 3/4" combo screws
- Eight (8) #8 x 1-1/2" combo screws

CUT SHEET

McKinney TA2714
Five Knuckle Standard Weight Hinge

McKinney
ASSA ABLOY
Experience a safer and more open world

SPECIFICATIONS:

MATERIAL:
Steel

DESCRIPTION:
Five Knuckle Standard Weight Hinge

FASTENERS:
- (8) 1/2" x 12-24 Machine Screws
- (8) 1 1/4" x #12 Wood Screws

OPTIONS:
- NRP–Non-Removable Pin
- TB–Ball Bearing
- TCA–Concealed Bearing
- RC–Round Corner - 1/4" radius furnished unless specified
- HT–Hospital Tip
- BT–Ball Tip
- FT–Flat Decorative Tip
- GT–Grooved Tip
- LT–Lined Tip
- RT–Round Tip
- ST–Steeple Tip
- SSF–Safety Stud Feature
- CC–4, 8, or 12 wire available
- CC-18–2, 4, 6, 8, or 10 wire available (2-18AWG wires and the remainder 28AWG wires)
- QC–4, 8, or 12 wire available
- MM–Magnetic Monitoring

NOTES:
- When doors are beveled specify TA4714

SIZE:
5" x 4 1/2"

AVAILABLE FINISHES:
- P–Prime Coat
- US3/632
- US4/633
- US5/609
- US10/639
- US10A/641
- US10B/640
- US15/646
- US26/651
- US26D/652
- 10BE–Bronze Satin Powder Coat
- BSP–Black Suede Powder Coat
- WSP–White Suede Powder Coat

PACKAGED/WEIGHT:
- 3 ea Per Box
- 24 ea Per Case
- Case Weight–32 lbs

UL/ANSI:
NFPA 80 UL Openings
A8112 Grade 2

McKinney
Berlin Operations
225 Episcopal Road
Berlin, CT 06037
www.mckinneyhinge.com

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SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass products.
2. Glazing sealants.
3. Glazing tapes.
4. Miscellaneous glazing materials.

1.2 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

C. IBC: International Building Code.

1.3 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glazing Accessory Samples: For sealants, in 12-inch lengths.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For glass.

C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.

B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors and who employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 WARRANTY

A. Manufacturer's Special Warranty for Heat-Soaked Tempered Glass: Manufacturer agrees to replace heat-soaked tempered glass units that spontaneously break due to nickel sulfide (NiS) inclusions at a rate exceeding 0.3 percent (3/1000) within specified warranty period. Coverage for any other cause is excluded.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. NGA Publications: "Glazing Manual."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.

1. Minimum Glass Thickness: 6 mm.

D. Strength: Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

B. Neutral-Curing Silicone Glazing Sealant, Class 50: Complying with ASTM C920, Type S, Grade NS, Use NT.

2.6 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.7 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Type recommended in writing by sealant or glass manufacturer.

D. Spacers: Type recommended in writing by sealant or glass manufacturer.

E. Edge Blocks: Type recommended in writing by sealant or glass manufacturer.

2.8 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Minimum required face and edge clearances.
3. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.6 CLEANING AND PROTECTION

A. Immediately after installation, remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.7 MONOLITHIC GLASS SCHEDULE

A. Clear Glass Type GL-1: Fully tempered float glass.

1. Minimum Thickness: 6 mm.
2. Safety glazing required.

END OF SECTION 08 80 00

SECTION 09 01 60.91 - TERRAZZO FLOORING RESTORATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Restoring and refinishing terrazzo floors.

1.2 REFERENCE STANDARDS

A. The National Terrazzo and Mosaic Association, Inc (NTMA):

1. NTMA – Terrazzo Specifications.

1.3 ACTION SUBMITTALS

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

1. Manufacturers technical data for sealer, cleaner and grout.

1.4 INFORMATIONAL SUBMITTALS

A. Submit letter clearly identifying the terrazzo system (epoxy, cement, etc) and that the products are suitable/compatible.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with not fewer than 5 years of documented experience.

1. Installer shall be a contractor member of NTMA in good standing and shall perform all work in accordance with NTMA standards.
2. Use only skilled journeyman who are familiar and experienced with materials and methods specified shall be used for terrazzo restoration/refinishing.

B. Samples/Mockups:

1. Crack Repair:
    a. Prepare a sample area for each type of crack repair required.
        1) Hairline cracks 1/64-inch to 1/16-inch in size.
        2) Cracks and voids larger than 1/8-inch.
    b. Repair shall demonstrate methods and quality of workmanship of crack repair.

2. Patching:
    a. Prepare on-floor, a sample of patching.
    b. Patch shall demonstrate methods and quality of workmanship of patch repair

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaner: Potable water, free of iron, all cleaners (optional) must be pH neutral.

B. Sealer: Liquid type to completely seal matrix surface; not detrimental to terrazzo components.

C. Grout: Color to match existing matrix.

D. Matrix: Pigmented epoxy to match sample submitted.

E. Aggregates: Aggregates to match Architect's approved sample.

2.2 EQUIPMENT

A. All work shall be executed with conventional terrazzo grinding equipment according to NTMA published trade practice.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform work in accordance with NTMA recommendations as posted on the NTMA website.
    1. NTMA Web Site: www.ntma.com.

3.2 PREPARATION

A. Cover and protect all adjacent finished surfaces during restoration process.

3.3 CRACK REPAIR

A. Determination:
    1. Architect and Contractor shall walk the entire floor and identify cracks and agree on the following:
        a. NA (No Action), RC (Repair Crack) or RT (Replace Terrazzo).
        b. Hairline cracks are classified as less than 1/32-inch (0.030-inch).
        c. Replacement (RT) shall be from architectural break to architectural break.

B. RC - Repair Crack:

1. Clean crack of loose material, dirt or sealer
2. Fill with resin/to match existing. Use aggregate in the crack if crack is wider than 1/4-inch.

3.4 RT - REPLACE TERRAZZO

A. General: If repair is not to architectural break or existing terrazzo divider strip, the joining edge shall be a saw tooth (jagged edge).

B. Remove areas to be replaced.

C. Clean area and prepare concrete for new terrazzo.

D. Repair concrete, fill cracks in concrete substrate as needed. Fill cracks in concrete with hardening epoxy

1. Optional Upgrade: Employ the use of a mesh (isolation membrane) to cover crack with liquid applied membrane (epoxy systems only).

E. Fill area with epoxy or cement /cement matrix and approved aggregate mixture/blend

3.5 INITIAL GRINDING

A. Wet or dry grind with appropriate medium diamonds/stones.

3.6 GROUTING

A. Cleanse floor with clean water and rinse. Wet grind with 50 or higher abrasive grit medium diamonds.

B. Remove excess water and machine or hand grout with cement or epoxy material to fill as needed.

3.7 CURING GROUT

A. Allow grout to cure a minimum of 12 hours. Maintain ambient air temperature between 70 degrees F and 80 degrees F.

3.8 FINE (FINAL) GRINDING

A. Grind with 120 grit carborundum or 200 grit resin bond diamond until grout has been removed from the terrazzo surface.

3.9 CLEANING AND SEALING

A. Rinse with clean water and allow too thoroughly dry.

B. Seal: Apply sealer per sealer manufacturer’s written directions.

C. Remove protection and clean adjacent surfaces effected by refinishing process.

3.10 PROTECTION

A. General Contractor shall protect finish floor from all site activity until Substantial Completion.

END OF SECTION 09 01 60.91

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type product.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

B. Evaluation Reports: For high-strength steel studs and tracks post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Framing Industry Association.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Notify manufacturer of damaged materials received prior to installation.

B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, in accordance with ASTM E90 and classified in accordance with ASTM E413 by an independent testing agency.

B. Horizontal Deflection: For non-composite wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 5 lbf/sq. ft.

C. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members," unless otherwise indicated.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with AISI S220 and ASTM C645, Section 10 for conditions indicated.

1. Steel Sheet Components: Comply with AISI S220 requirements for metal unless otherwise indicated
2. Protective Coating: Comply with AISI S220; ASTM A653/A653M, G40; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.
    a. Coating demonstrates equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.

B. Studs and Track: AISI S220.

1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; ProSTUD Drywall Framing or comparable product by one of the following:
    a. CEMCO; California Expanded Metal Products Co.
    b. TELLING Industries.
2. Minimum Base-Steel Thickness: As required by performance requirements for horizontal deflection.
3. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated, provide the following:

1. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-steel thickness, with minimum 1/2-inch- wide flanges.

1. Depth: 1-1/2 inches.

2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Installation Standard: ASTM C754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLATION OF FRAMING SYSTEMS

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
2. Multilayer Application: As required by horizontal deflection performance requirements unless otherwise indicated.

B. Install studs so flanges within framing system point in same direction.

C. Install tracks 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.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
    a. Install two studs at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

D. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.4 FIELD QUALITY CONTROL

A. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

B. Related Requirements:

1. Section 07 92 00 "Joint Sealants" for acoustical joint sealants installed in gypsum board assemblies.
2. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing that support gypsum board panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type product.

B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

1.3 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated in accordance with ASTM E90 and classified in accordance with ASTM E413 by an independent testing agency.

2.3 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.4 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C1396/C1396M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. American Gypsum.
    b. Georgia-Pacific Gypsum LLC.
    c. Gold Bond Building Products, LLC provided by National Gypsum Company.
    d. USG Corporation
2. Thickness: 5/8 inch.
3. Long Edges: Tapered.

B. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. American Gypsum.
    b. Georgia-Pacific Gypsum LLC.
    c. Gold Bond Building Products, LLC provided by National Gypsum Company.
    d. USG Corporation.
2. Core: 5/8 inch.
3. Long Edges: Tapered.
4. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Paper-faced galvanized-steel sheet.
2. Shapes:
    a. Cornerbead.
    b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    c. L-Bead: L-shaped; exposed long flange receives joint compound.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
    a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

2.7 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

C. Sound-Attenuation Blankets: As specified in Section 09 81 00 “Acoustical Insulation.”

D. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

A. Comply with ASTM C840.

B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

C. Locate edge and end joints over supports. 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.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

F. 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.

G. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

H. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

I. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: As indicated on Drawings.
2. Mold-Resistant Type: As indicated on Drawings.

B. Single-Layer Application:

1. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated and minimize end joints.
    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints in accordance with ASTM C840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners unless otherwise indicated.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated on Drawings.

3.5 FINISHING OF GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and in accordance with ASTM C840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
    a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Acoustical panels.
2. Metal suspension system.
3. Metal edge moldings and trim.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Acoustical panels.
2. Metal suspension system.
3. Metal edge moldings and trim.

B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:

1. Acoustical Panels: Set of 6-inch- square Samples of each type, color, pattern, and texture.
2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch- long Samples of each type, finish, and color.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Ceiling suspension-system members.
2. Structural members to which suspension systems will be attached.
3. Method of attaching hangers to building structure.
    a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.

4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
5. Size and location of initial access modules for acoustical panels.
6. Items penetrating finished ceiling and ceiling-mounted items including the following:
    a. Lighting fixtures.
    b. Diffusers.
    c. Grilles.
    d. Speakers.
    e. Sprinklers.
    f. Access panels.
    g. Perimeter moldings.
7. Minimum Drawing Scale: 1/4 inch = 1 foot.

B. Qualification Data: For testing agency.

C. Product Test Reports: For each acoustical panel ceiling, for tests performed by a qualified testing agency.

D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

E. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.
2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Source Limitations for Ceiling System: 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 E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A in accordance with ASTM E1264.
2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL PANELS – ACT-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries (www.armstrongceilings.com, 877-276-7876); Dune, Item 1772, or comparable product, approved by the Architect, by the following.

1. USG Corporation.

B. Acoustical Panel Standard: Provide manufacturer's standard panels in accordance with ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Classification: Provide panels as follows:

1. Type and Form, Type III Form 2: Mineral base with painted finish; Form 2 water felted.
2. Pattern: CE (perforated, small holes and lightly textured).

D. Color: White.

E. Light Reflectance (LR): Not less than 0.81.

F. Ceiling Attenuation Class (CAC): Not less than 30.

G. Noise Reduction Coefficient (NRC): Not less than 0.50.

H. Articulation Class (AC): Not applicable.

I. Edge/Joint Detail: Square.

J. Thickness: 5/8 inch.

K. Modular Size: 24 by 24 inches.

L. 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 in accordance with ASTM D3273, ASTM D3274, or ASTM G21 and evaluated in accordance with ASTM D3274 or ASTM G21.

2.4 METAL SUSPENSION SYSTEM

A. Product: Match existing.

B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories in accordance with ASTM C635/C635M and designated by type, structural classification, and finish indicated.

C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.

1. Fire Rating: None.
2. Structural Classification: Heavy-duty system.
3. End Condition of Cross Runners: Override (stepped) type.
4. Face Design: Flat, flush.
5. Cap Material: Cold-rolled steel.
6. Cap Finish: Painted white.

2.5 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated.

1. 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 times that imposed by ceiling construction, as determined by testing in accordance with ASTM E488/E488M or ASTM E1512 as applicable, conducted by a qualified testing and inspecting agency.

a. Type: Postinstalled expansion anchors.

b. Corrosion Protection, Carbon Steel: Components zinc plated in accordance with ASTM B633, Class SC 1 (mild) service condition.

2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing in accordance with ASTM E1190, conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.

2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- diameter wire.

C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch- thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

2.6 METAL EDGE MOLDINGS AND TRIM

A. Product: Match existing.

B. 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 design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Edge moldings to fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.

2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.7 ACOUSTICAL SEALANT

A. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION OF ACOUSTICAL PANEL CEILINGS

A. Install acoustical panel ceilings in accordance with ASTM C636/C636M and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Space hangers not more than 48 inches on center along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches on center and not more than 3 inches from ends. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.

1. Arrange directionally patterned acoustical panels as follows:
   a. As indicated on approved shop drawings.
2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. 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

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rubber base.
2. Stair nosing.
3. Transitions.

1.2 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 inches long.

C. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.4 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 degrees F or more than 90 degrees F.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 95 degrees F, in spaces to receive resilient products during the following periods:

1. 48 hours before installation.
2. During installation.

3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 95 degrees F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RUBBER BASE – RB-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite, a Tarkett company (www.tarkettna.com, 800-899-8916); Duracove or comparable product, approved by the Architect, by one of the following.

1. Flexco Corporation.
2. Roppe Corporation; Roppe Holding Company.

B. Product Standard: ASTM F1861, Type TP (rubber, thermoplastic).

1. Group I (solid, homogeneous).
2. Style: Cove.

C. Thickness: 0.125 inch.

D. Height: Match existing unless otherwise indicated on Drawings.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Colors: See Finish Legend on Drawings.

2.2 RUBBER STAIR NOSING – RST-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite, a Tarkett company (www.tarkettna.com, 800-899-8916); Resilient Vinyl Stair Nosing, Item VDL-XX-SQ, or comparable product, approved by the Architect, by one of the following.

1. Flexco Corporation.
2. Roppe Corporation; Roppe Holding Company.

B. Description: Vinyl nosing for carpet transition strips.

C. Colors: See Finish Legend on Drawings.

2.3 RESILIENT TRANSITIONS

A. Description: Flooring transitions.

B. Locations: Provide transitions at change of flooring and as indicated on Drawings.

C. Profile and Dimensions: As selected by Architect from manufacturer’s standards.

D. Colors and Patterns: As selected by Architect from manufacturer’s standards.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

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.

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.

C. Do not install resilient products until materials are the same temperature as 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.

D. 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.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
    a. Form without producing discoloration (whitening) at bends.
2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
    a. Cope corners to minimize open joints.

3.4 STAIR NOSING INSTALLATION

A. Comply with manufacturer's written instructions for installing stair nosing.

3.5 RESILIENT TRANSITION INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. 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.

3.6 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 13

SECTION 09 65 16 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Unbacked vinyl flooring.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of resilient flooring.

1. Include flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
2. Show details of special patterns.

C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.

D. Product Schedule: For resilient flooring. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of resilient flooring to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient flooring installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by resilient flooring manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store resilient flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 degrees F or more than 90 degrees F.

1.8 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 85 degrees F, in spaces to receive resilient flooring during the following periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 95 degrees F.

C. Close spaces to traffic during resilient flooring installation.

D. Close spaces to traffic for 48 hours after resilient flooring installation.

E. Install resilient flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient flooring, 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.

2.2 VINYL FLOORING - SF-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Nora by Interface (www.interface.com); Norament Grano or comparable product, approved by the Architect, by one of the following:

1. Gerflor USA.
2. Mannington Mills, Inc.
3. Roppe Corporation; Roppe Holding Company.

B. Product Standard: ASTM F 1344.

C. Thickness: 0.14 inch

D. Wearing Surface: Hammered.

E. Seamless-Installation Method: Heat welded.

F. Colors and Patterns: See Finish Legend on Drawings.

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 flooring manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient flooring and substrate conditions indicated.

C. Seamless-Installation Accessories:

1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
    a. Colors: As selected by Architect from manufacturer's full range to contrast with flooring.

D. Integral-Flash-Cove-Base Accessories:

1. Cove Strip: 1-inch radius provided or approved by resilient flooring manufacturer.
2. Cap Strip: Square metal, vinyl, or rubber cap. provided or approved by resilient flooring manufacturer.
3. Corners: Metal inside and outside corners and end stops provided or approved by resilient flooring manufacturer.

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 flooring.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to resilient flooring manufacturer's written instructions to ensure adhesion of resilient flooring.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient flooring manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient flooring 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.
4. 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.
    a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    b. 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.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient flooring until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient flooring.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles as indicated on approved shop drawings.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles in pattern of colors and sizes indicated on approved shop drawings.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

H. Seamless Installation:

1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.

I. Integral-Flash-Cove Base: Cove resilient flooring 6 inches up vertical surfaces, unless otherwise indicated in Finish Legend on Drawings. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.

1. Install metal corners at inside and outside corners.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient flooring.

B. Perform the following operations immediately after completing resilient flooring installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover flooring until Substantial Completion.

END OF SECTION 09 65 16

SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient floor tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of resilient floor tile.

1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts. Show details of special patterns.

C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

D. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 degrees F or more than 90 degrees F.

B. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 95 degrees F, in spaces to receive floor tile during the following periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 95 degrees F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient floor tile, 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.

2.2 LUXURY VINYL TILE – LVT-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Interface (www.interface.com); Brushed Lines 4.5 mm or comparable product, approved by the Architect, by one of the following:

1. Gerflor USA.
2. Mannington Mills, Inc.
3. Patcraft; a division of Shaw Industries, Inc.
4. Shaw Industries Group, Inc.; Berkshire Hathaway Company.

B. Tile Standard: ASTM F 1700.

1. Class: Class III, Printed Film Vinyl Tile.
2. Type: A, Smooth Surface.

C. Size: 25 cm by 1 m.

D. Colors and Patterns: See Finish Legend on Drawings

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 floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

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 floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile 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.
4. 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.
   a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
   b. 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.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles as indicated on approved shop drawings.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles in pattern of colors and sizes indicated on approved shop drawings.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover floor tile until Substantial Completion.

END OF SECTION 09 65 19

SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modular carpet tile.
2. Walk-off mat.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
   a. Review delivery, storage, and handling procedures.
   b. Review ambient conditions and ventilation procedures.
   c. Review subfloor preparation procedures.
2. Review methods and procedures related to walk-off mat installation

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
2. Include manufacturer's written installation recommendations for each type of substrate.

B. Shop Drawings:

1. For carpet tile installation, plans showing the following:
   a. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
   b. Carpet tile type, color, and dye lot.
   c. Type of subfloor.
   d. Type of installation.
   e. Pattern of installation.
   f. Pattern type, location, and direction.
   g. Pile direction.
   h. Type, color, and location of insets and borders.

i. Type, color, and location of edge, transition, and other accessory strips.

j. Transition details to other flooring materials.

2. For walk-off mat installation, including plans and details.

C. Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.

2. Walk-Off Mat: Manufacturer’s standard sample size.

D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data:

1. For carpet tiles to include in maintenance manuals. Include the following:

a. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.

b. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

2. For walk-off mat to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Carpet Tile:

1. 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.

a. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

B. Walk-Off Mat:

1. 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.

a. Grids: Equal to 5 percent of amount installed for each type indicated.

1.7 QUALITY ASSURANCE

A. Carpet Tile Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with the Carpet and Rug Institute's CRI 104.

1.9 FIELD CONDITIONS

A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.10 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, the following:

a. More than 10 percent edge raveling, snags, and runs.

b. Dimensional instability.

c. Excess static discharge.

d. Loss of tuft-bind strength.

e. Loss of face fiber.

f. Delamination.

3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE – CPT-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide J+J Flooring, Kinetex (www.jjflooringgroup.com, 800-241-4586); Network or comparable product, approved by the Architect, by one of the following:

1. Interface, Inc.
2. Mannington Commercial; a business unit of Mannington Mills, Inc.
3. Mohawk Carpet, LLC; The Mohawk Group.
4. Shaw Industries Group, Inc.; Berkshire Hathaway Company.
5. Tarkett USA.

B. Color and Pattern: See Finish Legend on Drawings.

C. Primary Backing/Backcoating: Manufacturer's standard composite materials.

D. Size: 12 by 48 inches.

E. Performance Characteristics:

1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.

2.2 CARPET TILE – CPT-2

A. Basis-of-Design Product: Subject to compliance with requirements, provide Tarkett (www.tarkettna.com, 800-248-2878); Create Space or comparable product, approved by the Architect, by one of the following:

1. Interface, Inc.
2. Mannington Commercial; a business unit of Mannington Mills, Inc.
3. Mohawk Carpet, LLC; The Mohawk Group.
4. Shaw Industries Group, Inc.; Berkshire Hathaway Company.

B. Color and Pattern: See Finish Legend on Drawings.

C. Size: 18 inches by 36 inches.

D. Backing: Synthetic non-woven.

E. Performance Characteristics:

1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.

2.3 WALK-OFF MAT – WOM-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Milliken & Company (www.millikenfloors.com, 800-824-2246); Obex Bar – Mono, Closed, or comparable product, approved by the Architect.

B. Description: Surface-mounted entrance flooring.

1. Bar Profile:
   a. Bar Material: Extruded aluminum with high-density polyethylene cushion backing.
   b. Plank Width: 10.67 inches by 39.37 inches (27.6 cm by 100 cm).
   c. Thickness (Nominal): 0.43 inches (11 mm)
2. Grids:
   a. Construction: Tufted, cut pile.
   b. Yarn Type: Monofilament.
   c. Dye Method: Solution Dyed.
   d. Color: See Finish Legend on Drawings.
3. Size: See Finish Legend on Drawings.

2.4 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives:

1. Carpet Tile: 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.
2. Entrance Flooring: Type recommended by manufacturer.

C. Walk-Off Mat:

1. Vinyl: Sloped vinyl edging.
   a. Size: 11mm deep by 39 mm wide.
   b. Corners: Prefabricated.
   c. Product: OBEX Vinyl Edge Kit manufactured by Milliken.

2. Aluminum: Sloped vinyl edging.
    a. Size: 11mm deep by 80mm wide.
    b. Corners: Field mitered.
    c. Product: Universal Aluminum Edging manufactured by Milliken.

PART 3 - EXECUTION

3.1 EXAMINATION – CARPET TILE

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Concrete Slabs: Verify that finishes comply with requirements and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

1. 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.
    a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
    c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

D. Wood Subfloors: Verify the following:

1. Underlayment over subfloor complies with requirements specified in Section 06 16 00 "Sheathing."
2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.

3.2 PREPARATION – CARPET TILE

A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. 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.

3.3 PREPARATION – WALK-OFF MAT

A. Ensure subfloor is level and clear of any loose material.

B. Repair any large area of damage.

C. Following reparations, make sure the area is clean and clear of debris.

D. Use a levelling compound or latex-based product to ensure a good surface for the installation.

E. Additionally, a tackifier or adhesive can be applied at this point for installations subject to heavy or wheeled traffic.

3.4 INSTALLATION – CARPET TILE

A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.

B. Installation Method: As recommended in writing by carpet tile manufacturer.

C. Maintain dye-lot integrity. Do not mix dye lots in same area.

D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

E. 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.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. 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.

H. Install pattern parallel to walls and borders.

3.5 INSTALLATION – WALK-OFF MAT

A. Install walk off mat in accordance with manufacturer’s written installation instructions and approved shop drawings.

B. Measure area and mark a center line to show where product should be laid first.

1. Make sure there is enough product from the same batch. It is important to not mix batches, there might be color variation.

C. Connect tiles to one another with use of hammer or mallet.

1. Install edges last.

D. Line up the straight edge with the mark and make the cut. For the outer part of the install, use the edge of the recess to align the straight edge.

1. Grids are designed to be cut with a sharp knife.
2. Connecting pins should be removed if the install finishes with a full tile, to give a clean finish to the edge. Mark the required measurement point using tape and knife.

E. Provide installation with room to allow for expansion and contraction to ensure tiles are flat and level.

F. Depending on ambient conditions, it might be necessary to leave a small gap (1/16-inch or 1/8-inch) where the installation meets a wall or recess edge.

G. Install edging.

3.6 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 68 13

SECTION 09 72 00 - WALL COVERINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vinyl wall covering.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data on physical characteristics, durability, fade resistance, and fire-test-response characteristics.

B. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern placement seams and termination points.

C. Samples for Verification: For each type of wall covering and for each color, pattern, texture, and finish specified, full width by 36 inches long in size.

1. Wall-Covering Sample: From same production run to be used for the Work.

a. Show complete pattern repeat.

D. Product Schedule: For wall coverings. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each wall covering, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For wall coverings to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same production run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall-Covering Materials: For each type, color, texture, and finish, full width by length to equal to 5 percent of amount installed.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for occupants after Project completion during the remainder of the construction period.

B. Lighting: Do not install wall covering until lighting that matches conditions intended for occupants after Project completion is provided on the surfaces to receive wall covering.

C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates in accordance with test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    a. Flame-Spread Index: 25 or less.
    b. Smoke-Developed Index: 50 or less.

2.2 VINYL WALL COVERING – VWC-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Koroseal (www.koroseal.com, 855-753-5474); Thatch-Flex or comparable product, approved by the Architect, by one of the following.

1. Designtex; Design Tex Group Inc. (The).
2. Innovations USA.
3. Knoll, Inc.

4. Maharam Fabric Corporation; Herman Miller, Inc.
5. Wolf-Gordon Inc.

B. Description: Provide vinyl products in rolls from same production run and complying with the following:

1. ASTM F793 for coverings.
    a. Category: VI, Type III, Commercial Serviceability (Vinyl Coated).

C. Width: 52 inches.

D. Backing: Woven (Osnaburg).

E. Colors: See Finish Legend on Drawings.

2.3 VINYL WALL COVERING – VWC-2

A. Basis-of-Design Product: Subject to compliance with requirements, provide Koroseal (www.koroseal.com, 855-753-5474); Galerie or comparable product, approved by the Architect, by one of the following.

1. Designtex; Design Tex Group Inc. (The).
2. Innovations USA.
3. Knoll, Inc.
4. Maharam Fabric Corporation; Herman Miller, Inc.
5. Wolf-Gordon Inc.

B. Description: Provide micro-vented vinyl products in rolls from same production run and complying with the following:

1. ASTM F793 for coverings.
    a. Category: V, Type II, Commercial Serviceability (Vinyl Coated).

C. Width: 53-55 inches.

D. Backing: Woven (Osnaburg).

E. Colors: See Finish Legend on Drawings.

2.4 ACCESSORIES

A. Moisture Barrier:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Laticrete International, Inc. (www.laticrete.com, 800-243-4788); Hydro Barrier Plus, or comparable product, approved by the Architect.

2. Description: Thin, load-bearing, self-curing, liquid rubber polymer easily applied to form a flexible, seamless waterproofing, anti-fracture membrane.

B. Adhesive: Mildew-resistant, nonstaining adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.

C. Primer/Sealer: Mildew resistant, complying with requirements in Section 09 91 23 "Interior Painting" and recommended in writing by primer/sealer and wall-covering manufacturers for intended substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation surfaces being true in plane and vertical and horizontal alignment, maximum moisture content, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, and mildew.

C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.

1. Gypsum Board: Apply primer/sealer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
2. Painted Surfaces:
    a. Check for pigment bleeding. Apply primer/sealer to areas susceptible to pigment bleeding as recommended in writing by primer/sealer manufacturer.
    b. Sand gloss, semigloss, and eggshell finishes with fine sandpaper.

D. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

E. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

F. Moisture Barrier: Prepare and apply on surfaces in accordance with manufacturer’s written instructions at locations indicated on Drawings.

3.3 INSTALLATION OF WALL COVERING

A. Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated.

B. Cut wall-covering strips in roll number sequence. Change the roll numbers at partition breaks and corners.

C. Install strips in same order as cut from roll.

1. For solid-color, even-texture, or random-match wall coverings, reverse every other strip.

D. Install wall covering without lifted or curling edges and without visible shrinkage.

E. Match pattern 72 inches above the finish floor.

F. Install seams vertical and plumb at least 6 inches from outside corners and 6 inches from inside corners unless a change of pattern or color exists at corner. Horizontal seams are not permitted.

G. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without overlaps or gaps between strips.

H. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

3.4 CLEANING

A. Remove excess adhesive at seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended in writing by wall-covering manufacturer.

C. Replace strips that cannot be cleaned.

D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION 09 72 00

SECTION 09 81 00 – ACOUSTICAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall acoustical batts.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including:

1. Data on insulation product characteristics, performance criteria, and limitations.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.

1.3 INFORMATIONAL SUBMITTALS

A. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions for specified Products.

B. Performance Data: Submit appropriate research reports or evaluation data for products listed in this Section.

1.4 QUALITY ASSURANCE

A. Obtain each building insulation type from one manufacturer through single source.

B. Insulation Installed in Concealed Locations Surface Burning Characteristics:

1. Batt Insulation: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Manufacturer: Manufacturer with minimum of ten years experience manufacturing or marketing products in this Section shall provide products listed.

D. Installer: Installer with at least two years documented experience successfully installing insulation on projects of similar type and scope as specified in this Section.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

C. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by manufacturer.

D. Store materials in such a manner to permit easy access for inspection and handling.

1. Label insulation packages to include material name, production date and/or product code.

E. Handle materials to avoid damage. When installing or otherwise handling these insulation products, wear NIOSH-approved dust mask or respirator, gloves and long-sleeved, loose-fitting clothing closed at the neck and wrists. Wear safety glasses when installing.

1.6 PROJECT CONDITIONS

A. Protect adjacent work of other trades from damage. Clean substrates of substances harmful to insulation.

1.7 WARRANTY

A. Standard limited warranty against manufacturing defects.

PART 2 - PRODUCTS

2.1 WALL ACOUSTICAL BATTS

A. Basis of Design: Subject to compliance with requirements, provide Owens Corning Insulating Systems, LLC (www.owingscorning.com); Pink Next Gen Fiberglass Sound Attenuation Batts (SAB) or comparable product by one of the following:

1. Johns Manville.
2. CertainTeed Corporation.

B. Description: ASTM C665, Type I, unfaced preformed glass fiber; ASTM E136; friction fit type.

1. Thickness: As indicated on Drawings
2. Width: Width to suit framing spacing.
3. Location: See Drawings and Schedule at end of this Section
4. Surface Burning Characteristics:
    a. Flamespread (ASTM E84): Less than 25.
    b. Smoke Developed (ASTM E84): Less than 50.
5. Combustion Characteristics (ASTM E136): Pass.
6. Dimensional Stability: Linear stability less than 0.1 percent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which work of this Section will be installed.

B. Examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified.

C. Verify that adjacent materials are dry and ready.

D. Walls: Verify that electrical and mechanical services within walls have been inspected and tested.

3.2 INSTALLATION

A. Comply with manufacturer's installation instruction for particular conditions of installation.

B. Walls:

1. Friction-fit acoustical batts between studs after cover material has been installed on one side of cavity.

3.3 PROTECTION

A. Protect installed products until completion and project closeout.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.4 SCHEDULE

A. Install acoustical insulation where indicated on Drawings and as follows:

1. Walls: Acoustical batts.

END OF SECTION 09 81 00

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.
2. Label each coat of each Sample.
3. Label each Sample for location and application area.

C. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.3 CLOSEOUT SUBMITTALS

A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 1 gallon of each material and color applied.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer’s label with the following information:

1. Product name and type (description).
2. Batch date.
3. Color number.
4. VOC content.
5. Environmental handling requirements.
6. Surface preparation requirements.
7. Application instructions.

B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 degrees F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 degrees F and 95 degrees F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin Williams Company (The) (www.sherwin-williams.com); Products, or comparable products, approved by the Architect, by one of the following:

1. PPG Industries, Inc.
2. Benjamin Moore & Co.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: See Finish Legend on Drawings.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner may 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.

2. Testing agency will perform tests for compliance with product requirements.

3. Owner may direct Contractor to stop applying coatings 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

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.

1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

B. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

a. Gypsum Board: 12 percent.

b. Concrete: 12 percent.

c. Masonry (Clay and CMU): 12 percent.

2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. 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.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.

2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 PAINTING SCHEDULE

A. PNT-1:

1. Application includes:

a. Gypsum board walls.

2. System:

a. Primer: ProMar 200 Zero VOC Latex Primer, B28W2600
b. Finish (2 coats): ProMar 200 Zero VOC Latex, Eggshell, B20-2600

3. Color: See Finish Legend on Drawings.

B. PNT-2:

1. Application includes:

a. Gypsum board ceilings.

2. System:

a. Primer: ProMar 200 Zero VOC Latex Primer, B28W2600

b. Finish (2 coats): ProMar 200 Zero VOC Latex, Flat

3. Color: See Finish Legend on Drawings.

C. PNT-3:

1. Application includes:
    a. Hollow metal doors and frames.
2. System:
    a. Primer: Pro Industrial Pro-Cryl Universal Acrylic Primer
    b. Finish (2 coats): Pro Industrial Waterbased Alkyd Urethane, Semi-Gloss, B53-1151
3. Color: See Finish Legend on Drawings.

D. PNT-4:

1. Application includes:
    a. Accents.
2. System:
    a. Primer: ProMar 200 Zero VOC Latex Primer, B28W2600
    b. Finish (2 coats): ProMar 200 Zero VOC Latex, Eggshell, B20-2600
3. Color: See Finish Legend on Drawings.

E. PNT-5:

1. Application includes:
    a. Accents.
2. System:
    a. Primer: ProMar 200 Zero VOC Latex Primer, B28W2600
    b. Finish (2 coats): ProMar 200 Zero VOC Latex, Eggshell, B20-2600
3. Color: See Finish Legend on Drawings.

F. SC-1:

1. Application includes:
    a. Existing bare concrete floors.
2. Preparation: See Finish Legend on Drawings.
3. System:
    a. Finish (2 coats): H&C Products Group, H&C Clarishield Water-Based Wet-Look Concrete Sealer
4. Color: Clear

END OF SECTION 09 91 23

SECTION 10 21 23 - CUBICLE CURTAINS AND TRACK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cubicle-curtain support systems.
2. Cubicle curtains.

1.2 ACTION SUBMITTALS

A. Product Data: For each type product.

B. Shop Drawings: For curtains and tracks.

1. Show layout and types of cubicles, sizes of curtains, number of carriers, anchorage details, and conditions requiring accessories. Indicate dimensions taken from field measurements.
2. Include details of blocking for track support.

C. Samples for Verification: For each type of product required, prepared on Samples of size indicated below:

1. Curtain Fabric: Not less than 10 inches square and showing complete pattern repeat, from dye lot used for the Work, with specified treatments applied. Mark top and face of material.
2. Mesh Top: Not less than 10 inches square.
3. Curtain Track: Not less than 10 inches long.
4. Curtain Carrier: Full-size unit.

D. Product Schedule: For curtains and tracks. Use same designations indicated on Drawings.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For curtains, tracks, and hardware to include in operation and maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Curtain Carriers and Track End Caps: Full-size units equal to 3 percent of amount installed for each size indicated, but no fewer than 10 units.
2. Curtains: Full-size units equal to 10 percent of amount installed for each size indicated, but no fewer than two units.

1.5 WARRANTY

A. Cubicle Curtain Fabric: 1-year.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Cubicle Curtains: Provide curtain fabrics with the following characteristics:

1. Laundering: Launderable to a water temperature of not less than 160 degrees F.
2. Flame Resistance: Provide fabrics identical to those that have passed NFPA 701 when tested by a qualified testing agency acceptable to authorities having jurisdiction.
    a. Identify fabrics with appropriate markings of a qualified testing agency.

2.2 CUBICLE-CURTAIN SUPPORT SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AR Nelson.
2. Covoc Corporation.
3. Healthcare Curtains.
4. inpro Corporation.

B. Extruded-Aluminum Curtain Track:

1. Curtain-Track Mounting: As indicated on Drawings.
2. Finish: Clear satin anodized.

C. Curtain-Track Accessories: Fabricate splices, end caps, connectors, end stops, coupling and joining sleeves, wall flanges, brackets, ceiling clips, and other accessories from same material and with same finish as track.

1. End Stop: Removable with carrier hook.

D. Curtain Roller Carriers: Two nylon rollers and nylon axle with nylon hook.

E. Exposed Fasteners: Stainless steel.

F. Concealed Fasteners: Stainless steel.

2.3 CUBICLE CURTAIN FABRIC – CC-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide Maharam (www.maharam.com, 800-645-3943); Prose or comparable product, approved by the Architect, by one of the following:

1. AR Nelson.
2. Covoc Corporation.
3. Healthcare Curtains.
4. inpro Corporation.

B. Fabric:

1. 70 percent fire resistant polyester.
2. 30 percent polyester.
3. Color: See Finish Legend on Drawings.

C. Curtain Grommets: Two-piece, rolled-edge, rustproof, nickel-plated brass; spaced not more than 6 inches on center; machined into top hem.

D. Mesh Top: Not less than 20-inch-to 22-inch- high mesh top.

1. Mesh: No. 50 nylon mesh.

A. Curtain Tieback: Nickel-plated brass chain; one at each curtain termination.

2.4 CURTAIN FABRICATION

A. Continuous Curtain Panels:

1. Width: Equal to track length from which curtain is hung plus 10 percent of added fullness, but not less than 12 inches of added fullness.
2. Length: Equal to floor-to-ceiling height, minus depth of track and carrier at top, and minus clearance above the finished floor of 12 inches.
3. Top Hem: Not less than 1 inch and not more than 1-1/2 inches wide, triple thickness, reinforced with integral web, and double lockstitched.
4. Mesh Top: Top hem of mesh not less than 1 inch and not more than 1-1/2 inches wide, triple thickness, reinforced with integral web, and double lockstitched. Double lockstitch bottom of mesh directly to 1/2-inch triple thickness, top hem of curtain fabric.
5. Bottom Hem: Not less than 1 inch and not more than 1-1/2 inches wide, double thickness and double lockstitched.

6. Side Hems: Not less than 1/2 inch and not more than 1-1/4 inches wide, with double turned edges, and single lockstitched.
7. Vertical Seams: Not less than 1/2 inch wide, double turned and double stitched.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install tracks level and plumb, according to manufacturer's written instructions.

B. For tracks of up to 20 feet in length, provide track fabricated from single, continuous length.

1. Curtain-Track Mounting: As indicated on Drawings.

C. Curtain-Track Mounting:

1. Surface-Track Mounting: Fasten tracks to ceilings at intervals recommended by manufacturer. Fasten tracks to structure at each splice and tangent point of each corner. Center fasteners in track to ensure unencumbered carrier operation. Attach track to ceiling as follows:
    a. Attach track to suspended ceiling grid with manufacturer's proprietary clip.
2. Suspended Track Mounting: Install track with suspended supports at intervals of not more than 84 inches. Fasten support at each splice and tangent point of each corner. Secure ends of track to wall with flanged fittings or brackets.

D. Track Accessories: Install splices, end caps, connectors, end stops, coupling and joining sleeves, and other accessories as required for a secure and operational installation.

E. Curtain Carriers: Provide curtain carriers adequate for 6-inch spacing along full length of curtain plus an additional carrier.

F. Cubicle Curtains: Hang curtains on each curtain track. Secure with curtain tieback.

END OF SECTION 10 21 23

SECTION 10 22 39 - FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manually-operated, top-supported, acoustical panel partitions.
2. Overhead structural support system.
3. Supports for attaching support tracks to overhead structural support system.

1.2 DEFINITIONS

A. STC: Sound Transmission Class.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Operable panel partitions.

B. Shop Drawings: For operable panel partitions.

1. Include plans, elevations, sections, attachment details, and numbered panel installation sequence.
2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.

C. Samples for Verification: For each type of exposed material, finish, covering, or facing, prepared on Samples of size indicated below:

1. Textile Facing Material: Full width by not less than 36-inch- long section of fabric from dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat.
2. Panel Edge Material: Not less than 3 inches long.
3. Hardware: One of each exposed door-operating device.

D. Delegated Design Submittals: For operable panel partitions.

1. Include design calculations for seismic restraints that brace tracks to structure above.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Partition track, track supports and bracing, turning space, and storage layout.
2. Suspended ceiling components.
3. Structural members to which suspension systems will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling including the following:
    a. Lighting fixtures.
    b. HVAC ductwork, outlets, and inlets.
    c. Speakers.
    d. Sprinklers.
    e. Smoke detectors.
    f. Access panels.

B. Setting Drawings: For embedded items and cutouts required in other work.

C. Qualification Data: For Installer and testing agency.

D. Product Certificates: For each type of operable panel partition.

1. Include approval letter signed by manufacturer acknowledging panel facing material complies with requirements.

E. Product Test Reports: For each operable panel partition, for tests performed by a qualified testing agency.

F. Field quality-control reports.

G. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For operable panel partitions to include in maintenance manuals. Include:

1. Panel finish facings and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
2. Seals, hardware, track, track switches, carriers, and other operating components.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same production run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Panel Finish-Facing Material: Furnish full width in quantity to cover both sides of two panels when installed.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Preparation of the opening shall conform to the criteria set forth per ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protectively package and sequence panels in order for installation.

B. Clearly mark packages and panels with numbering system used on Shop Drawings.

C. Do not use permanent markings on panels.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Faulty operation of operable panel partitions.
    b. Deterioration of metals, metal finishes, and other materials beyond normal use.
2. Warranty Period: Three years from date of Substantial Completion.
3. Hinges: Lifetime warranty.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design seismic bracing of tracks to structure above.

B. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties in accordance with test methods indicated:

1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance in accordance with ASTM E90, determined by ASTM E413, and rated for not less than the STC indicated.

C. Fire-Test-Response Characteristics: Provide panels with finishes complying with one of the following as determined by testing identical products by a testing and inspecting agency acceptable to authorities having jurisdiction:

1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

a. Flame-Spread Index: 25 or less.

b. Smoke-Developed Index: 450 or less.

2. Fire Growth Contribution: Complying with acceptance criteria of local code and authorities having jurisdiction.

2.2 OPERABLE ACOUSTICAL PANEL PARTITIONS

A. Operable Acoustical Panel Partitions: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Modernfold, Inc. (www.modernfold.com, 855-897-0421); Acousti-Seal Encore Operable Partition or comparable product, approved by the Architect, by one of the following.

a. Advanced Equipment Corporation.

b. KWIK-WALL Company.

c. Moderco Inc.

B. Panel Operation: Manually-operated, paired panels.

1. Series of paired flat panels hinged together in pairs, manually operated, top supported with operable floor seals and automatic top seals.

C. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and tamper-resistant concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.

D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.

1. Panel Width: Standard widths.

E. STC: Not less than 56.

F. Panel Thickness: Nominal dimension of 4 inches.

G. Panel Materials:

1. Steel Frame: Steel sheet, manufacturer's standard nominal 16-gage minimum thickness for uncoated steel.
2. Steel Face/Liner Sheets: Tension-leveled steel sheet, 0.0598-inch minimum nominal thickness for uncoated steel.
3. Panels welded to steel frame.

H. Panel Closure: Manufacturer's standard unless otherwise indicated.

1. Initial Closure: As indicated.
2. Final Closure: Constant-force, lever-operated mechanical closure expanding from panel edge to create a constant-pressure acoustical seal.
3. Lead panel notched to accommodate a 12-inch riser for theater seating.

I. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

1. Hinges: Manufacturer's standard.

J. Finish Facing: Fabric wall covering

2.3 SEALS

A. Description: Seals that produce operable panel partitions complying with performance requirements and the following:

1. Manufacturer's standard seals unless otherwise indicated.
2. Seals made from materials and in profiles that minimize sound leakage.
3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.

B. Vertical Seals: Socketed.

C. Horizontal Top Seals: Automatic operable top seal to allow for flush mounted track.

D. Horizontal Bottom Seals: Manual floor seals with 2 inch operating range and 120 lbs. of downward pressure; Modernfold Sureset.

2.4 PANEL FINISH FACINGS – UF-1

A. Description: Finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.

B. Fabric Wall Covering:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Carnegie; Xorel Strie, 817, or comparable product, approved by the Architect.

C. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.

2.5 SUSPENSION SYSTEMS

A. Tracks: Steel mounted directly to overhead structural support, designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.

1. Head Closure Trim: As required for acoustical performance; primed for field finish.

B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.

C. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine flooring, floor levelness, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF OPERABLE PANEL PARTITIONS

A. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.

B. Install panels in numbered sequence indicated on approved shop drawings.

C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

D. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

E. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals. Perform test and make adjustments before NIC testing.

3.3 ADJUSTING

A. Adjust operable panel partitions, hardware, and other moving parts to function smoothly, and lubricate as recommended by manufacturer.

B. Verify that safety devices are properly functioning.

3.4 MAINTENANCE SERVICE

A. Maintenance Service: Beginning at Substantial Completion, maintenance service is to include 12 months' full maintenance by manufacturer's authorized service representative. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operable-partition operation. Parts and supplies are to be manufacturer's authorized replacement parts and supplies.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION 10 22 39

SECTION 10 26 00 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Wall guards.
2. Corner guards.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For each type of wall protection showing locations and extent.

1. Include plans, elevations, sections, and attachment details.

C. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:

1. Wall Guards: 12 inches long. Include examples of joinery, corners, end caps, and field splices.
2. Corner Guards: 12 inches long. Include example top caps.

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type of exposed plastic material.

B. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of wall protection product to include in maintenance manuals.

1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of cover installed, but no fewer than two, 96-inch- long units.
2. Corner-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of cover installed, but no fewer than two, 48-inch- long units.
3. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store wall protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 70 degrees F during the period plastic materials are stored.
2. Keep plastic materials out of direct sunlight.
3. Store plastic wall-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 degrees F.
    a. Store corner-guard covers in a vertical position.
    b. Store wall-guard covers in a horizontal position.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of wall-protection units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
    b. Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.
2. Warranty Period: Limited Lifetime.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain wall-protection products from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

2.3 WALL GUARDS – WG-1

A. Wall Guards: Standard-duty assembly consisting of continuous snap-on cover installed over concealed, continuous retainer.

1. Basis-of-Design Product: Subject to compliance with requirements, provide inpro Corporation; 1600 Wall Guard, or comparable product, by one of the following:
    a. Construction Specialties, Inc.
    b. Nystrom, Inc.
    c. Pawling Corporation.
2. Cover: Extruded plastic, minimum 0.08-inch wall thickness; as follows:
    a. Profile: Rounded bullnose profile, nominal 6 inches high by 1 inch deep.
    b. Color and Texture: See Finish Legend on Drawings.
3. Continuous Retainer: Minimum 0.08-inch- thick, one-piece, extruded aluminum.
4. End Caps and Corners: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.
5. Accessories: Concealed splices and mounting hardware.
6. Mounting: Surface mounted directly to wall.
7. Mounting Height: See Finish Legend on Drawings.

2.4 CORNER GUARDS – CG-1

A. Flush-Mounted, Plastic-Cover Corner Guards: Manufacturer's standard, PVC-free assembly consisting of snap-on, resilient plastic cover that is flush with adjacent wall surface, installed over retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition; full wall height.

1. Basis-of-Design Product: Subject to compliance with requirements, provide inpro Corporation; 150BN BluNose, High Impact Corner Guard, or comparable product, by one of the following:
    a. Construction Specialties, Inc.
    b. Nystrom, Inc.
    c. Pawling Corporation.

2. Cover: Extruded rigid plastic, minimum 0.08-inch wall thickness; as follows:
    a. Profile: Nominal 3-inch- long leg and 1/4-inch corner radius.
    b. Height: 4 feet
    c. Size: See Finish Legend on Drawings.
    d. Color and Texture: See Finish Legend on Drawings.
3. Continuous Retainer: Minimum 0.060-inch- thick, one-piece, extruded aluminum.
4. Retainer Clips: Manufacturer's standard impact-absorbing clips.
5. Aluminum Cove Base: Nominal 4 inches high.

2.5 MATERIALS

A. Plastic Materials: Chemical- and stain-resistant, unplasticized polyvinyl chloride (uPVC) with the addition of impact modifiers ; extruded and sheet material as required, thickness as indicated. No plasticizers shall be added (plasticizers may aid in bacterial growth).

B. Aluminum: Continuous aluminum retainer of 0.080-inch (2mm) thickness shall be fabricated from 6063-T5 aluminum, with a mill finish.

C. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

2.6 FABRICATION

A. Fabricate wall protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.7 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine walls to which wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Complete finishing operations, including painting, before installing wall protection.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

A. Installation Quality: Install wall protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Mounting Heights: Install wall protection in locations and at mounting heights indicated on Drawings.

C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.

1. Provide anchoring devices and suitable locations to withstand imposed loads.
2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches apart.
3. Adjust end caps as required to ensure tight seams.

3.4 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.

END OF SECTION 10 26 00

SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Toilet accessories.

1.2 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

B. Samples: For each exposed product and for each finish specified, full size.

1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 TOILET ACCESSORIES

A. Source Limitations: Obtain each type of toilet accessory from single source from single manufacturer.

B. Paper Towel (Folded) Dispenser - TA03:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick (www.bobrick.com); Fino Collection Surface-Mounted Paper Towel Dispenser, B-9262, or comparable product, approved by the Architect, by one of the following:
    a. ASI-American Specialties, Inc.
    b. Bradley Corporation.
    c. Gamco Commercial Restroom Accessories; Bobrick Washroom Equipment, Inc.
2. Mounting: Surface mounted.
3. Minimum Capacity: 400 C-fold or 525 multi-folded paper towels.
4. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
5. Lockset: Tumbler type.
6. Refill Indicator: Pierced slots at sides or front.

C. Automatic Soap Dispenser – TA19:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick (www.bobrick.com); Automatic Wall-Mounted Foam Soap Dispenser, B-2013, or comparable product, approved by the Architect, by one of the following:
    a. ASI-American Specialties, Inc.
    b. Bradley Corporation.
    c. Gamco Commercial Restroom Accessories; Bobrick Washroom Equipment, Inc.
    d. GOJO Industries.
2. Description: Automatic dispenser with infrared sensor to detect presence of hands; designed for dispensing soap in lather form.
3. Mounting: Surface mounted.
4. Capacity: 800 ml.
5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
6. Refill Indicator: Indicator light
7. Low-Battery Indicator: Indicator light.

2.2 MATERIALS

A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch- minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B19, flat products; ASTM B16/B16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B30, castings.

C. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch-minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A653/A653M, with G60 hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

2.3 FABRICATION

A. 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.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories in accordance with 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.

1. Remove temporary labels and protective coatings.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 10 28 00

SECTION 22 00 01 – PLUMBING
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SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 19785
08-9-2024
SHANE T. BULMAN
SOUTH CAROLINA
CROW & BULMAN ENGINEERING NO. C00486
CERTIFICATE OF AUTHORIZATION

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WASHING MACHINE SUPPLY AND DRAIN BOX 11
AIR ADMITTANCE VALVES 11
INSULATION 12
DIELECTRIC UNIONS 13
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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 a water sample is analyzed and approved by a South Carolina Dept. of Health and Environmental Control certified laboratory. Lab fees shall be paid for by the Plumbing Contractor.

PERMITS AND FEES:

The Contractor shall obtain and pay for all permits required, give all legal notices and pay all fees for utility connections, for inspections, for back flow protection certification or as otherwise required for the work.

PHASING:

Refer to construction phase schedule requirement in section 1010 for schedule of the work.

CODE:

The entire Plumbing System shall be installed in accordance with the standards prescribed by the International (and SC) Plumbing Code, International (and SC) Fuel Gas Code, and other applicable local codes. System shall comply with all requirements of the S.C. Department of 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.

SEISMIC RESTRAINTS:
No seismic restraints required.

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 or located in a mechanical mezzanine) which is not insulated, galvanized or previously painted shall be properly prepared and cleaned and given a zinc rich prime coat and a final coat of black protective enamel.

All gas pipe (regardless of location) shall be painted as indicated above except the color shall be yellow.

SEWER AND WATER MAIN CONNECTIONS:
Sewer: Connect to the existing municipal building sewer and manholes as indicated on plumbing site plan.

Water: Connect to the 4" service line 5' outside the building as indicated on the plumbing site plan.

Storm Drainage: Connect to site storm drains 5' outside of the building. Continuation shall be by other divisions.

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. Outside Sewer:
   Outside underground sewer and waste pipe, from a point 5' outside of the building, shall be Schedule 40 PVC DWV pipe conforming to ASTM D-2665 and ASTM D-1785.

   Pipe shall be installed per ASTM D-2321.

D. 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.

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:
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, 1277, and 540, and shall be tested at 15psi minimum pressure. Couplings shall be by Mission, Ideal, Clamp-all or Husky.

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.

C. Outside Sewer – Test outside sewer pipe for leakage when required by DHEC officials.

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

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. Cold water piping shall have ½" thickness.

   Specified: Armaflex
   Substitute: K-Flex, Aeroflex

2. Hot Water Lines Underground: Shall be insulated with 1-1/2" thick Pittsburg
   Corning "Foamglass" or 1" of polyisocyanurate Dow Trymer 2000. Pipe and fittings shall be finished with 50 mil thickness Polyguard Insulrap laminated polyethylene/rubberized asphalt covering installed per manufacturer's recommendations. Pipe shall be laid on a minimum 3" deep sand bed and shall be back filled with sand to a minimum of 3" above insulation.

3. 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.

4. 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.

5. Roof Drains: Insulate the base of each roof drain with 1" thick sheet applied with adhesive; Armaflex, K-Flex, or Aeroflex.

6. 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
Faucets:	Chicago, T&S Brass, Zurn
Flush Valves:	Sloan, Zurn,
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 sweat 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. 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. Floor mounted water closets shall be secured with solid brass closet bolts.

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.

All tank type water closets and water closet/flush valve combinations shall meet current MaP performance ratings for public restrooms with a rating of not less than 1000GmPF.

P-1 Sim Lab Sink (ADA): Elkay LRADQ191965 single compartment, 18 gauge, stainless steel, 19"x 19" x 6-1/2" deep sink. Furnish with Chicago #116.123 sensor faucet with 8" high gooseneck spout, manual temperature control handle, and 12v plug-in transformer. Furnish with Just #J35SSF perforated rear drain.

P-2 Break Room Sink (ADA): Elkay #ELUHAS321655 stainless steel, 18 gauge, 32"x16"x5.5" deep, double compartment sink, with rear drain. Furnish with a Chicago #1102 eight inch high swing spout faucet with hand spray and with aerator. Furnish with Just #J35 STP basket strainer. Where required for ADA accessibility compliance, provide with McGuire 155w.c. offset trap and tail piece assembly.

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, not operating the system with windows or doors open, and not operating the system 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.

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 Specifications section 01 50 00 of the General Requirements for additional clarification of the General Contractors responsibilities.

If the condition of ductwork or equipment requires professional cleaning (as determined by the Engineer), an independent, NADCA certified contractor shall be engaged by the mechanical contractor at no additional cost to the owner.

AS-BUILT DRAWINGS:
Mark any changes in pipe or duct routing, equipment, or deviations from Contract Drawings on clean set of prints and a digital file; deliver to architect for transmittal to owner at completion of contract.

SUBSTITUTE EQUIPMENT:

A. In the event the Contractor substitutes any equipment or materials in lieu of that indicated on the drawings and specified; any change in service connections (electrical, structural, piping, controls, drains, etc.) or fire rating or any related items, shall require the contractor to make all necessary coordination changes. The contractor shall assure that the changes do not alter the system functions as intended with original equipment.

B. All materials and equipment shall be new and shall conform to the grade, quality and standards of those specified.

C. Design of the system is based on installation of specified materials and equipment. Other materials and equipment may be used subject to prior approval by the Architect. Approvals granted will be issued by addenda to the specifications. Request for prior approval shall be made in writing ten (10) days prior to the bid date.

D. The substitute manufacturers listed in these specifications shall be acceptable substitutes if they meet the specifications in all respects.

PHASING:
Refer to construction phase and schedule requirements in specifications section 01 10 00.

ACCEPTANCE AND COMPLETION OF JOB:

A. Upon completion of the job, the contractor shall furnish to the owner three complete sets, in ring binders, of all equipment instructions, including: guarantees, operation, maintenance, and installation data. Contractor shall also provide the information listed above in electronic PDF format, on a portable flash drive.

B. The contractor shall furnish the Engineer with a signed statement from the owner's representative to the extent that operation of the system is thoroughly understood for making minor adjustments in the operation and in maintaining the equipment. Provide owner training for the entire system operation. Where indicated in the "Equipment" section of these specifications, equipment training shall be provided by the equipment manufacturer's representatives.

C. After work has been completed, tested, and adjusted, the systems shall operate for five 8-hour days under normal operating conditions to demonstrate that they fulfill requirements of the plans and specifications and that they operate satisfactorily.

D. All equipment and materials shall be thoroughly cleaned and spot painted as required.

E. Furnish record drawings from HVAC and controls contractor.

F. Furnish Test & Balance Report.

G. Furnish 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 one (1) full year 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.

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).

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

      Wind:
      1) All rooftop equipment

Specified: Seismic Control and Specialties
Substitute: Mason, Amber-Booth, Kinetics Noise Control, VMC, Vibro-Acoustics, Caldyn

DEMOLITION:
All materials and equipment removed shall become the property of the contractor and shall be disposed of by the contractor.

Any materials and equipment which the Owner wishes to salvage shall be removed by the Owner prior to the start of the Contractor's works. Coordinate with Owner.

Asbestos removal shall be by the Owner. If the Contractor suspects an area contains asbestos, the Owner/Architect should be contacted immediately.

No demolition with cutting torches shall be allowed in finished areas of the building.

See notes on drawings for extent of demolition.

PIPING:

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. Heat Pump Loop 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, 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.

Any connections with galvanized iron or copper pipe to a stainless steel drain pan shall have a dielectric coupling.

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.

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. Heat pump piping shall not require insulation.

2. Refrigerant Suction and Liquid Piping:
Insulate with 1” thick rubber based closed cell, UV resistant, elastomeric foam.

Insulation and covering shall have 25/50 flame spread and smoke developed ratings.

Insulation exposed to the weather shall be protected with minimum 40 mil thickness, pre-fabricated, self-adhering, waterproof composite membrane wrap. Wrap shall be UV-resistant aluminum foil/polymer laminate over rubberized asphalt by Flexclad-400 or Alumaguard

Manufacturers: Armacell AC/Accoflex, K-Flex (hard tubing)
ArmaCell ArmaFlex Shield (linesets)

3. 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

4. Piping Exposed Inside the Buildings (including mechanical room):

Fiberglass: In addition to the all service jacket, all piping shall be covered with a lightweight, .010" thickness smooth aluminum jacket and banded with aluminum straps 8" on center.

At the contractor's option, Knauf Redi-Klad 1000 factory applied, zero perm, with embossed aluminized jacket may be used in lieu of aluminum covering.

Armaflex: Cover with 30 mil PVC covers and fittings. Insulation cover and fitting shall be Johns Manville "Zeston 2000" Series or equal. Insulation cover and fittings to be secured/sealed with adhesive.

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. 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.

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. Triple Duty Valve: Valve shall function as a non-slam check valve, balancing, positive shut-off valve. Valve shall have calibrated balancing adjustment, 175 psig working pressure rating, back seating valve stem.

Specified: Bell & Gossett
Substitute: Armstrong, Victaulic, Muller, Taco, Grundfos

5. Flexible Coupling/Connectors:
   At each pipe connection 2" and larger, provide a corrugated stainless-steel hose and braid connector. Connector shall be rated at minimum 160 psi @ 70 F. Connectors shall have 150 psi ASA steel companion flanges.
   Specified: 2" and larger: Metraflex
   Substitute: Mason, Keflex, Amber-Booth, Flex Hose

   For terminal equipment branch pipe connectors 1½" and smaller. 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.

   Specified: 1-1/2" and smaller: Metraflex
   Substitute: Mason, Keflex, Amber-Booth, Flex Hose

6. Automatic Flow Control Valves: (see Control Section of the specifications for pressure independent control valves PIC).
   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

7. 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, by terminal unit manufacturer

8. Chemical Pot Feeder:
   Pot feeder shall have 200 psi rating, screw top 31/2" diameter, 5 gallon capacity, bottom drain and capable of accepting a filter bag kit. Neptune DBF-5, Wingert F-DB-5, Vector FA-1000-AL.

   Particle Separator: Painted steel construction, centrifugal separation, 98% removal of 74 micro size particles and larger.

   Specified: Lakos # I L-B
   Substitute: Griswold

K. Thermometers and Gauges:
Furnish and install thermometers and gauges where shown on the drawings.

1. Thermometers shall be 7" scale, adjustable angle, in black case, and red spirit filled tube.

   All thermometers shall be mounted in separable socket. 0 to 100 degrees F range chilled water, 30 to 240 degrees for hot water or hot and chilled water, or 0-120 degrees for water source heat pump systems. Provide extended stem at insulated pipe. Trerice BX914, Weiss, Weksler, Miljoco, or Winters.

2. Pressure Gauges: Shall have 4-1/2" steel case, 0-60 psig range (unless noted otherwise). Trerice #600C with #865-1, 300 psi gauge cock, Weiss, Weksler, Miljoco, or Winters.

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. Heat Pump Supply; Heat Pump Return
2. Condensate

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.

Specified: Nalco
Substitute: None

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. Low Pressure (2" Pressure Class): All ductwork; supply, return, exhaust, and outdoor air, unless noted otherwise.

2. 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. For vented attic ductwork, insulation shall be 2.2" thick (R=6.0), 1lb. density fiberglass with metalized mylar seamless vapor barrier jacket.
Branch Connectors:	Spin-in conical tap

Specified: Flexmaster Type 5M
Substitute: Thermaflex, Hart & Cooley

F. Spiral Metal Duct:
All high pressure round, all round duct over 14" diameter, and elsewhere as noted on the drawings, all oval supply duct, and elsewhere as indicated on the drawings shall be spiral lock seam fabricated of ASTM-A653/A527 galvanized sheet metal, with G-90 coating, of the following minimum dimensions, unless noted otherwise:

Diameter	Std.Pipe Gauge	Ribbed Pipe Gauge
3-14"	26	26
15-26"	24	26
27-36"	22	26
37-50"	20	24

All fittings shall be factory fabricated of galvanized steel with spot weld and bonded seams. Gauge as follows: 3"-14"/24 ga, 15"-26"/22 ga, 27"-50"/20 ga, 52"-60"/18 ga. For ribbed construction fittings weight may be one gauge lighter. Elbows shall be 1 ½ duct diameter radius, 5 piece gore above 12" and die stamped 12" or less.

Suspended exposed duct shall have a circular band iron hanger with a threaded rod at the centerline of the duct. See SMACNA Manual for strap rod sizes.

Access doors shall be Type ARZ-W with insulated door as manufactured by United Sheet Metal or equal. All branch connectors shall have a conical tee fitting, a conical tap fitting, or a 45^0 lateral take-off.

Duct sections and fittings shall be connected as follows:

1) Standard:
   i. Metal slip joint couplings with duct sealant and sheet metal screws (standard).

   ii. At the contractor's option, ductwork with a diameter less than 24" diameter may be gasketed joints, such as Lindab "Spirosafe".

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. Flexible Branch Duct Connectors: Where flexible duct connectors are indicated on the plans, the maximum length of flexible duct shall not exceed 6' 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 65^0F 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 180^0F, per ASTM-C411.

   Liner shall be secured with spotter pins or impact pins (GripNail) and 100% adhesive coverage. Adhesive shall be approved by manufacturer and applied per manufacturer instructions. Where welding pins are used, adjust amperage according to the manufacturer's specifications to prevent burning/melting of the liner and to reduce smoke generation while maintaining acceptable weld integrity.

   Specified: Armacell AP "Coilflex" Duct Liner or Armacell AP "Armaflex" Duct Liner
   Substitute: K-Flex, or by prior approved equal

3. Exterior Duct Wrap:
   Ductwork shall be insulated with R=5.0 (installed), 2" thick, ¾ pcf, flexible, ASTM C1290 fiberglass duct wrap with a factory laminated reinforced scrim kraft foil vapor barrier facing. Insulation shall be secured with seams stapled with flare door type staples (6" o.c.) and sealed with two coats of Childers CP-30/34 mastic (or equal by Design Polymerics or by prior approved) and with an intermediate layer of open weave glass fabric. On ducts over 24 inches wide, additionally secure the insulation on the duct bottom with welding pins and push-on washers, 16 o.c. Duct wrap shall be UL listed and not exceed flame spread (25) and smoke developed (50) per ASTM E84. Duct shall have "Out of Package" R valve equal to 6.1. Insulation shall be manufactured by Owens Corning, Certainteed, Knauf, or Manville.

4. Application (Duct):
   a. All WSHP units and dedicated outdoor air unit supply ductwork, unless noted otherwise: Rectangular supply and return air ductwork and plenums for all units shall have 1" thick, 3 PCF density elastomeric foam duct liner for the first 10 linear ft. The remainder of the rectangular, round, and oval supply duct shall have exterior fiberglass wrap. The remainder of the return shall not require insulation.
   b. All transfer ducts shall have elastomeric foam liner, 1" thick x 3 PCF.
   c. Exhaust duct shall not require insulation.
   d. Flexible duct and dual wall spiral shall be factory insulated.
   e. HVAC ductwork located outside shall be insulated with elastomeric liner, thickness shall be 2".
   f. Fresh air ductwork, including outdoor air units, ventilation air intakes, shall have exterior flexible wrap, 2" thick.

g. 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.)

MOTORS:
Unless otherwise noted, all motors shall be 40 degrees C rise, dripproof, minimum 1.15 service factor. All motors shall have overload protection.

All motors served by a variable speed drive shall be rated for variable speed service. Motors shall have motor shaft grounding protection.

Electronic Commutated Motors (ECM):
Motor shall be a brush-less DC, electronic commutation (EC) motor specifically designed for fan applications. Motors shall be permanently lubricated with heavy-duty ball bearings to match the fan load and pre-wired to the specific voltage and phase. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled as noted in the control specifications. Motor shall have internal overload protection.

MOTOR STARTERS:
A. Standard:
Provide motor starters where indicated on the equipment schedule and in the equipment specifications.

All starters shall be complete with overload protection for each line. Each starter shall be equipped with a selector switch marked “ON”-“OFF”-“AUTO”. Each motor starter shall have a control circuit transformer and holding coil. Coordinate the control voltage with controls contractor. Auxiliary contacts shall be furnished as required to fulfill the control sequence. Control transformers shall be rated at 100VA (minimum) to power the holding coil and controls.

Indoor mounted starters shall have NEMA I enclosures, outdoor mounted starters shall be NEMA 3R.

Each motor starter shall have a nameplate indicating its associated equipment and equipment no. (i.e., hot and chilled water pump). Each tag shall be black laminated phenolic plastic with engraved letters and shall be secured with screws (not glue).

Specified: Square D
Substitute: GE, Siemens, Cutler Hammer, Sprecher/Schuh

B. Variable Speed Drives:
Provide pulse width modulated, adjustable frequency drive which generates a sine-coded, adjustable voltage/frequency, three phase output for speed control of any conventional squirrel cage induction motor. The drive shall maintain a power factor of not less than .95 throughout its speed range.

1. Design Features shall include:
   a. Sine-coded, pulse width modulated output
   b. 16-bit microprocessor control logic
   c. Overload capability of 110% for 60 seconds
   d. Coast or ramp to stop

e. Adjustable acceleration and deceleration
f. Run and fault LEDS
g. Run and fault contacts for customer use
h. Controlled speed range of 10:1
i. Process follower input: 4-20MA or 10VDC
j. Touch pad operator controls with five digit digital frequency/speed meter
k. Critical frequency rejection circuit
l. Slip compensation
m. Torque limiting circuit
n. NEMA 1 enclosure (indoor) or NEMA 3R/FVFF (forced ventilated, fan filtered), outdoor.
o. 5% Input A/C line reactors
p. Speed pot for manual speed adjustments
q. Communications board (Lon, BacNet, etc. as required to match the Building Management system vendor for data reports to the Building Management system.
r. Output carrier frequency programmable @ 0.5,1,2,4, or 8 KHZ and randomly modulated about the selected frequency
s. Power factor not less than .98 lagging @ any load

2. Protective Features shall include:
   a. Current limited stall prevention during acceleration, deceleration and run conditions
   b. Automatic restart after momentary power loss
   c. Start into a rotating motor with speed search
   d. Diagnostic circuit display
   e. DC bus CHARGE readout
   f. Isolated operators controls
   g. Phase to phase short circuit protection
   h. Ground fault protection
   i. Electronic thermal motor overload
   j. Anti-windmill protection with DC injection before start
   k. Heat sink over temperature protection

3. Adjustment shall include:
   a. Acceleration: 0.1 to 1800 seconds
   b. Deceleration: 0.1 to 1800 seconds
   c. Maximum frequency of up to 60 HZ +/- 10% via touch pad
   d. Critical frequency rejection
   e. Minimum frequency
   f. Maximum frequency
   g. Carrier frequency
   h. Torque limit
   i. Slip compensation
   j. DC injection braking time
   k. DC injection braking amplitude
   l. Multi-step speed settings, 5 maximum

4. Environmental and Service Conditions shall be suitable for:
   a. Ambient service temperature: 10 degrees to 40 degrees C
   b. Humidity to 90%
   c. Service factor of 1.0

5. Starter shall be:
   a. ETL or UL listed

6. Starter Options shall include:
   a. H-O-A Switch
   b. Ammeter
   c. Line Bypass with Magnetic Contactors and overload protection, where indicated.

7. Provide a variable speed starter where indicated on the schedule:

8. Drives shall have the following points addressable from the Building Management System:
   Motor Frequency
   a. Motor Frequency Read
   b. Motor Current
   c. Acceleration time
   d. Deceleration time
   e. Motor Rated Voltage
   f. Motor Rated Amperag
   g. Motor KW
   h. Drive Run
   i. Drive Status
   j. Alarms
   k. Alarm-Faults: Clear All
   l. Alarm-Faults: Notification

The drive shall carry a two (2) year “on site” warranty.

The starter shall be tested with fully loaded induction motors. The combined test data shall be analyzed to insure adherence to quality assurance specifications.

The adjustable frequency drive shall be sized for the motor horsepower and voltage as scheduled on the drawings.

Provide factory assisted start-up and check-out services. Set drives for a minimum speed of 25%.

Provide output line reactors when the distance between the drive and the motor exceeds 150 ft.

Outdoor starters shall not be mounted in direct sunlight. Provide stainless steel sun shield as required.

Factory OEM Drives:
Variable frequency drives provided and installed by the manufacturer shall meet all features, adjustments, and safeties listed above.

Independent Drives (provided separate from equipment). All drives for the HVAC equipment shall be one manufacturer.

Specified: ABB
Substitute: Graham, Reliance, Tosiba, Square “D”

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.

EQUIPMENT:

A. General

1. Utility Rebate Accounting:
   In order to facilitate the Owner's utility rebate applications, the Contractor shall provide itemized accounting of qualifying equipment. The information shall include individual equipment model numbers, and cost per unit (dollars). The equipment requiring this information shall include the following:
   1) ECM Motors
   2) Variable Frequency Drives (VFD's)
   3) Heat Pumps (Air Source & Water Source)
   4) Ductless Split Systems

2. Submit shop drawings on all equipment listed in this section of the specifications.

3. Extra Filters: For all equipment requiring air filters, the owner shall be furnished one set of filters. The owner's extra set of filters shall be in addition to the filters in place at the date of substantial completion. The mounted filters shall be clean at the date of substantial completion. (If equipment is operated during the construction phase of the project, the construction phase filters shall be replaced as needed to maintain clean coils and equipment). Filters during construction shall be rated MERV 8 at occupancy.

   Cleanable filters for DSS or VRF systems:
   For wall mounted and ceiling cassette ductless split system (DSS) or variable refrigerant flow system (VRF) indoor units, filters shall be washable type. Provide an extra set of washable filters for each unit. The extra set of filters shall be in addition to the filters in place at the date of substantial completion.

4. Air Handling System Fan Drive Modification:
   Provide all necessary fan sheave changes and/or pulley adjustments as required to comply with the Test and Balance section of these specifications.

5. Equipment and Access Tags: Provide an engraved phenolic nametag with 1" high letters for each piece of equipment scheduled on the HVAC plans (excluding air devices). The tag shall be labeled to match the equipment schedule tag i.e. AC-1, AHU-1, EF-1, etc. The tag shall also include the unit model, and the unit serial number. The tag shall be secured to the equipment with screws or chains and at an easily visible location. For equipment exposed in finished areas, install tag inside unit cabinet.

   Where filters, fans, or water coils are located above a ceiling, secure a marker tag with ¼" high letters stating the units tag i.e. "T-37", "FILTER", "FAN", and/or "WATER COIL" to the ceiling grid indicating the ceiling tile to be removed for best access.

   Secure a marker tag with ¼" high letters on each VAV box control panel indicating DDC address.

6. Integration with Building Management System:
   Where HVAC equipment is provided with its own BACnet factory controller, shop drawings shall include BACnet device number and BACnet object information. Equipment vendor shall be responsible for meeting the 'Sequence of Operations' specified under the Control Section of this specification and/or as shown on the drawings (if controller is factory installed). The equipment vendor and controls contractor shall coordinate to ensure that the sequence of operations is fully executed.

B. Heat Pumps: Water Source (WSHP)
Heat Pumps shall be completely assembled, piped, internally wired, charged, and tested.
All units shall be UL or CSA listed and shall have capacities rated in accordance with ISO 13256-1 standards. Standard units shall be rated to operate at 50deg/heating and 100deg/cooling entering water temperature.

Blower shall have a DWDI forward curved centrifugal fan. Units with capacity of 7½ tons and up shall have belt drive blowers and adjustable sheaves. Units 6 tons and smaller shall have multispeed tap, direct drive, blowers. Single phase motors shall be permanent split capacitor (ECM) with internal overload protection. As indicated on the Heat Pump Schedule, motors shall be ECM, with speed controller.

Heat pump air/refrigerant coils shall have 3/8" seamless copper tube with aluminum plate fins and factory leak tested to 450 psi. The refrigerant/water heat exchanger coil shall be a copper tube-in-tube type suitable for 200 psi water pressure and 650 psi refrigerant working pressure.

Compressors shall be hermetic scroll type, with R-410A refrigerant, and with internal and external vibration isolator mountings. Motors shall have internal overload protection. Entire refrigerant circuit shall have copper piping. Refrigerant circuit shall have thermostatic expansion valve, high and low pressure Schrader valves, and high and low pressure safeties. Compressors shall have a 5 yr. non pro-rated warranty. Where indicated on the equipment schedules, provide a hot gas reheat dehumidification mode of operation. Reheat shall provide 90% rise in coil discharge air temperature.

The control package shall provide a 75 VA transformer with circuit breaker. The controller shall include a lockout relay, anti-short cycle compressor protection, random start delay, immersion type freeze protection, brown-out protection, fan relay, low pressure time delay, compressor delay on start and an open relay for night setback or pump request. LEDs (light emitting diodes) shall be included for diagnostics of the equipment. Provide a terminal board for connections and control from the building's energy management DDC control system.

Filtration shall be provided with a separate filter housing. See Filter Housing Section of these specifications.

Unless indicated otherwise on the drawings, units shall be connected to the piping system with 2' long braided metal sheathed, flexible hose kits, furnished by the unit manufacturer. Hoses shall be designed for 250 psi working pressure. Pressure drop at rated GPM shall not exceed 0.5 psi.

Drain pan shall be non-corrosive and double sloped. Provide a factory mounted, safety cut-off float switch at each heat pump, to shut-down the compressor with an indication of high water in the condensate drain pan.

Refer to the "Controls" section of these specifications for the sequence of operation and integration into the Building Management system.

Specified: Trane
Substitute: Florida Heat Pump, Daikin/McQuay, Climate Master, Daikin Applied, Water Furnace

C. Heat Pumps: Water Source (Vertical Stack Units)
General:
Equipment is factory assembled, piped, internally wired, fully charged with R-410A refrigerant and oil.

Units are tested at the factory.

Products are certified in accordance ANSI/AHRI/ASHRAE/ISO13256-1 Certification Program. All units have an ETL label that meets USA (UL std) and Canadian (CSA std). All units come standard with a 5-year compressor warranty.

Air-to-Refrigerant Coil
Internally finned, 3/8-inch copper tubes mechanically bonded to a configured aluminum plate fin are standard. Coils are leak tested at the factory to ensure the pressure integrity. The coil is leak tested to 200 psig and pressure tested to 650 psig.

The refrigerant coil distributor assembly shall be of orifice style with round copper distributor tubes. The tubes are sized consistently with the capacity of the coil. Suction header is fabricated from rounded copper pipe.

A thermostatic expansion valve is factory selected and installed for a wide range of control.

Casing
The cabinet assembly is constructed of heavy-gauge galvanized steel. It houses the blower, fan and control hook-up to the unit thermostat or zone sensor. A basepan with condensate hose is included with the cabinet design. Base rails allow ease of chassis installation/removal for service or maintenance.

The chassis is constructed of heavy-gauge galvanized steel. The chassis houses the compressor, reversing valve, water-to-refrigerant heat exchanger, air-to-refrigerant heat exchanger, thermal expansion valve, corrosive resistant condensate pan, and water inlet/outlet connections. The chassis is installed into the cabinet by sliding it in place on the locating rails within the cabinet design.

The insulation contains a flame spread rating of less than 25 and smoke density rating of less than 50 (as tested in accordance with ASTM-85). The refrigeration piping insulation is an elastomer insulation that has a UL 94-5 V rating.

Compressors
All units have a direct-drive, hermetic, rotary (unit sizes 009 to 018) or scroll (unit sizes 024 and 036) type compressor. The compressor contains rubber isolation to aid in noise reduction during compressor start/ stop.

Internal thermal overload protection and compressor anti-short cycle timers are also provided. Protection against excessive discharge pressure is provided by means of a high pressure switch. Loss of charge protection is provided by a low pressure switch.

Controls
The unit control box contains all necessary devices to allow heating and cooling operation to occur from a unit mounted, plug-in thermostat or sensor. The devices are as follows:

- 24 Vac energy limiting class II 75 VA breaker type transformer.
- 24 Vac blower motor relay
- 24 Vac compressor contactor for compressor control
- A high pressure switch protects the compressor against operation at refrigerant system pressures exceeding 650 psig.

- A low pressure switch is provides that trips at 40 psig. A freezestat is provided - tripping at either 35° or 20°F.
- Power connections are made through a factory installed conduit located at the top of the unit's cabinet. The conduit grants access directly to the control box.
- Provide with factory on/off switch

Nameplate information is given for the application of either time-delay fuses or HACR circuit breakers for branch circuit protection from the primary source of power.

Single phase, single voltage rated equipment is designed to operate between plus or minus 10% of nameplate utilization voltage. Operation outside of this range may adversely affect the service life of the equipment.

Unit shall have 24V terminal strip for connection to the application specific controller provided by the controls contractor.

Drain Pan
The condensate pan is constructed of corrosive resistant material. The bottom of the drain pan is sloped in two planes to pitch the condensate towards the drain connection. Condensate is piped to a lower base pan through condensate hose for ease of chassis removal. A drain hose is factory clamped onto the drain connection for field connection.

Filters
One inch, throwaway filters are standard and factory installed. The standard filters have an average resistance of 76% and dust holding capacity of 26-grams per square foot.

Indoor Fan
The blower is a double width, double inlet (DWDI) forward curved wheel. The blower is an ECM fractional horsepower motor. The blower/motor assembly is designed for efficient and quiet operation. The ECM is a constant CFM type. The motor is programmed to provide four airflow profiles and is shipped on Profile B, which is rated CFM of the unit. The motor is also factory programmed to provide 80% airflow in the fan only mode for additional energy savings. Service or maintenance to the blower/motor is easily achieved by removal of a single bracket.

Refrigerant Circuits
The refrigerant circuit contains a thermal expansion device, service pressure ports, and system safety devices factory-installed as standard.

Return-Air Hinged Acoustical Door:
A frame mounted acoustical door is provided to attenuate noise. The door is hinged to the wall frame, and contains magnetic latches to keep the door aesthetically in place. It is flush mounted to the wall as to not protrude into the owner space. The door allows access to the unit for ease of filter replacement.

The door is constructed from heavy-gauge formed galvanized steel and painted light white. Door shall be provided with hex key for vandal resistance.

Sound Attenuation
Sound attenuation is applied as a standard feature in the product design. The enhanced reduction package includes a heavy gauge base plate, gasket and insulation around the compressor enclosure.

For all units, provide the deluxe sound reduction package that includes a heavy gauge base plate,

gasket and insulation around the compressor enclosure and vibration isolation between the chassis and cabinet. An additional dampening treatment is applied around the compressor enclosure to achieve greater acoustical reductions.

Water-to-Refrigerant Heat Exchanger
The water-to-refrigerant heat exchanger is a co-axial coil for maximum heat transfer. The copper or optional cupro-nickel coil is deeply fluted to enhance heat transfer and minimize fouling and scaling. The coil has a working pressure of 650 psig on the refrigerant side and 400 psig on the water side.

Specified: Trane
Substitute: Florida Heat Pump, Daikin/McQuay, Climate Master, Daikin Applied, Water Furnace

D. Air Diffusers and Grilles:
Air devices shall be as scheduled on the drawings. All such devices shall have baked-on white finish unless noted otherwise. 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.

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: Price
Substitute: Titus, Krueger, Metalair, J & J Register, Carnes, Nailor, Tuttle & Bailey

E. Air Diffusers –Variable Air Volume:
Self-Contained Mechanical:
Thermally powered VAV diffusers shall have a self-adjusting damper and self-contained. Each unit shall have one room thermostat/actuator and one changeover thermostat/actuator.

Diffusers shall have a thumbwheel and temperature scale to adjust the cooling set point and another thumbwheel and temperature scale for the heating set point. The adjustment shall be above a hinged face panel. Each set point shall be separately adjustable between 70^0F and 78^0F. The initial set point shall be factory set at 74^0F.

All VAV diffusers shall have a dial and scale to adjust minimum flow between 5 cfm and 50% of maximum flow without tools. Minimum flow shall be factory set 10%. A fixed maximum flow stop shall be factory set for the fully open-air flow of the specified inlet size.

VAV diffusers shall have a lever which will open the damper for balancing without tools. The balancing lever shall be accessible from the outside of the diffuser without folding down the appearance panel or removing any part of the diffuser.

Specified: Price "Varitherm"
Substitute: Kreuger, Rickard, Acutherm "Thermafuser"

F. 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

2. Branch Duct Volume Damper: (Maximum 12" high/rectangular or 14"dia./rd):
   Shall be single-blade, locking quadrant dampers, with 2" stand-off handles for insulated duct.

   Specified: Ruskin, MD-25 (Rectangular)
   Ruskin, MDRS-25 (Round)
   Substitute: Arrow, Louvers & Dampers, Air Balance, Lloyd, Pottorff, Safe Air
   National Control Air, Nailor, Greenheck

3. Main Duct Volume Damper, Branch Ducts (greater than 12" high or 14"dia), & Return Air Dampers: Shall be multi-blade, opposed blade action type dampers. Dampers shall have flanged faces and be installed in a duct with mating flanges. Dampers shall have either locking quadrant operator or motorized operator if required by control sequence; motor provided by control section of specification.

   Specified: Ruskin CD-35 (Rectangular), CDRS-25 (Round)
   Substitute: Arrow 1770, Louvers & Dampers CD-400, Air Balance, Lloyd, Pottorff, Safe Air, National Control Air, Nailor, Greenheck

4. Motorized Return, Outside Air & Relief Air Dampers:
   Rectangular: Multi-blade, extruded aluminum, air foil, opposed blade action with side linkage or face linkage, suitable for a motorized operator. Low leakage vinyl edge seals and flexible metal jamb seals. Dampers shall have a motorized operator where required by control sequence. Unless noted otherwise, actuators shall be provided by the controls vendor. Damper operator shaft shall extend outside ductwork.

   Round: Dampers shall consist of a single circular blade mounted to a shaft. Inside frame surface shall be clean and smooth with no full circumference blade stops or similar inward projections. Frames shall be aluminum construction and shall include rolled stiffener beads to allow easy sealing of spiral ductwork joints. Damper blade shall be double skin equivalent to 14 gage and shall include a neoprene seal sandwiched between the two sides. Leakage through the damper

in the closed position shall not exceed .15 cfm per inch of blade circumference at a pressure differential of 4" w.g. Leakage through the bearings shall be less than 1/4" cfm at 4" static pressure.

Specified: Ruskin CD-50 (Rectangular)
Ruskin CDRS-25 (Round)
Substitute: Arrow Pinlock, Air Balance, Louvers & Dampers TSD-400 UD, Pottorff, Safe Air, National Control Air, Nailor, Greenheck

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.

G. 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.

Projects designed using ASHRAE Standard 62, IAQ Procedure shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within ASHRAE Standard 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled with the technology submitted. The manufacturer shall provide independent test data on a previous installation performed within the last two years and in a similar application, that proves compliance to ASHRAE 62 and the accuracy of the calculations.

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.

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.

H. Filter Housing:
Where indicated on the plans, provide a manufactured filter housing to retain a 4" throwaway pleated nonwoven fabric media filter. Final filter track shall have a removable channel or be constructed to accommodate a 2" filter (in lieu of a 4" filter). Each filter housing shall be designed to accommodate two standard filter sizes, 12 x 24 and/or 24 x 24. See track detail on the plans.

The filter housing shall be constructed of 16 gauge galvanized steel, with upstream and downstream flanges. Filter track shall be extruded aluminum and gasketed with replaceable polypropylene pile air seals. The housing shall have access door on each side, sealed with neoprene gaskets at the door perimeter and at the filter edge. Doors shall be secured with positive pressure adjustable easy grip, 1½” diameter, hand knobs with swivel latches or spring clamp latches. Housing wider than 4’ shall have intermediate support mullions.

See the equipment schedule for number and size of filters. In each housing, provide throw away type, 2” thick adhesive impregnated fabric, pleated media, minimum MERV-8 rating. Fabric shall conform to NFPA 90A Smoke and Fire Rating requirements. Furnish extra filters as required in the General Equipment Requirements of these specifications. Submit sample filter track to the engineer for review.

Specified: Camfil-Farr
Substitute: Air Filter, Flanders, AAF, P&G

I. Condensate Pumps:
Unit shall have polypropylene tank and impeller, with ABS cover, volute, and float. Pump shall be 115v with 6' power cord, 42 GPH at 15 ft. head. Unit shall be provided with safety switch to interlock with WSHP units.

Specified: Little Giant #VCMX

Substitute: Saurmann, Aspen, Hartel

J. Ductless Split Heat Pump:
Provide a matched split heat pump system consisting of an indoor evaporator section and an outdoor pad mounted compressor/condensing unit.

Indoor and outdoor coils shall be aluminum plate fins mechanically bonded to copper tubes. Unit shall have a factory pre-charged refrigerant system with rotary compressor, refrigerant reversing valve, external service valves and charging port. The unit shall be ETL and ARI listed. Air handler shall have factory washable filter. Provide factory 1" filter box for ducted models.

Unit shall have hard wired thermostat.

Unit condenser coils shall have vandal and hail guards.

Provide a condensate lift pump, with safety shut off switch.

Warranty:
Units shall be provided with a 3 year parts/labor warranty (including refrigerant charge) and a 5 year parts warranty.

Specified: Mitsubishi
Substitute: Daikin

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.

3. 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.

4. 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.

5. 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.

6. All wiring in return air plenums shall be UL rated for non-combustion and smoke developed per ASTM B84.

7. 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.

8. 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).

9. Coordinate locations for data drops with electrical contractor and owner.

10. 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.

11. Provide a minimum of two days instruction on the system operation to the owner.

12. Actuator fail positions: Outside air dampers shall fail closed. Return air dampers shall fail open. Terminal unit hot water control valves shall fail open.

13. Where motorized outside air dampers are located in systems with variable speed supply fans, the Test and Balance contractor shall determine the required position of the outside air damper at maximum supply fan speed and minimum supply fan speed. The damper shall modulate as the supply fan speed varies to maintain a constant outside air volume. If demand control ventilation is also implemented in the same system, the T&B contractor shall determine the maximum and minimum damper positions at both the maximum and minimum supply fan speeds (4 points).

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 twelve (12) 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:
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.

1. 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.

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 (Heat Pumps):
   a. Service – loop water (40^0F –150^0F)
   b. Pattern – full port, ball valve
   c. 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.
   d. Trim – stainless steel ball and stem, PTFE seats, EPDM 0-ring packing
   e. Operator – two position, sufficient torque to provide smooth operation and tight shut-off at 50 psi differential. Operator shall have manual release for manual positioning.
   f. Manufacturer – Belimo, Delta, or by controls manufacturer.

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. Humidity Sensor:
Unit shall have a polymer capacitance sensor unaffected by condensate or high humidity or contaminants. Unit shall have 1-10 VDC output & with short circuit and reverse polarity protection. Unit accuracy shall be 3% +/- over 0-100% RH range. Mounted shall be duct or wall sensing, as indicated on the plans.

Specified: Mamac HU-224/225 Belimo, or prior approved equal.

9. Campus Network and Software:
   The owner shall have an existing compatible computer with hard drive. 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.

   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 Managements.

10. Building DDC System Summary: The facility management Building Management system (BMS) shall be capable of total integration of the facility infrastructure systems with user access to all system data either locally over a secure internet within the building or by remote access by a standard Web Browser over the internet. This shall include HVAC control, lighting control, utility metering, energy management, alarm monitoring, and all trending, reporting and maintenance management functions related to all normal building operations as indicated on the drawings or elsewhere in this specification.

    The entire BMS shall be comprised of interoperable, stand-alone digital controllers communicating to each other on an open protocol communication network within the facility and communicating with operators via the Internet. The Internet interface shall be via a standard WEB browser such as Microsoft Internet Explorer. The BMS shall communicate to third party systems such as chillers, boilers, air handling systems, and other building management related devices with open, interoperable communication capabilities. The WEB based solution shall not be based on any specific platforms that would prevent it from operating on Internet appliances such as cell phones, PDA, pager, Smart Phone, etc. Provide a minimum of 5 years of software updates for the BMS.

    Provide a minimum of two days of instruction to the owner's personnel on the operation of the Computer Software.

    BMS Graphics:
    1. System Graphics. The operator interface software shall be graphically based and shall include at least one graphic per piece of equipment or occupied zone, graphics for each chilled water, hot water, and/or water source heat pump system, and graphics that summarize conditions on each floor of each building included in this contract. Indicate thermal comfort on floor plan summary graphics using dynamic colors to represent zone temperature relative to zone setpoint.
        a. Minimum graphics resolution shall be 1920 x 1080 for display of detailed system graphics.
        b. Floor Plan Graphics. Floor plan graphics shall be capable of allowing the floor plan graphic to dynamically size relative to the end user's monitor resolution.
        c. Functionality. Graphics shall allow operator to monitor system status, to view a summary of the most important data for each controlled zone or piece of equipment, to use point-and-click navigation between zones or equipment, and to edit setpoints and other specified parameters.

d. Animation. Graphics shall be able to animate by displaying different image files for changed object status.
e. Alarm Indication. Indicate areas or equipment in an alarm condition using color or other visual indicator.
f. Format. Graphics shall be saved in an industry-standard format such as BMP, JPEG, PNG, GIF, or SVG. Web-based system graphics shall be viewable on browsers compatible with World Wide Web Consortium browser standards. Web graphic format shall require no plug-in or shall only require widely available no-cost plug-ins.

2. Custom Graphics. Custom graphic files shall be created with the use of a graphics generation package furnished with the system. The graphics generation package shall be a graphically based system used to create and modify graphics that are saved in the same formats as are used for system graphics.
3. Graphics Library. Furnish a complete library of standard HVAC equipment graphics such as chillers, boilers, air handlers, terminals, fan coils, and unit ventilators. This library also shall include standard symbols for other equipment including fans, pumps, coils, valves, piping, dampers, and ductwork. The library shall be furnished in a file format compatible with the graphics generation package program.

The BMS shall include the following capabilities:
a. Microprocessor based control functions, with proportional-integral-derivative (P-I-D) response.
b. Automated global scheduling logic to download commands/schedules/instructions to multiple remote system sites.
c. Battery back-up with lithium battery and minimum of 72 hours to maintain RAM, upon loss of power.
d. 365 day/year time clock functions. Stand alone on loss of power.
e. Hi & lo limit temperature control (at each Program Zone).
f. Hi limit humidity control (each humidity sensor).
g. Software program in non-volative ROM for protection upon loss of power.
h. Demand limit control.
i. Optimized “Start-Stop” function.
j. Software shall store user defined trends for loading to the facility host computer.
k. Sufficient input/output points as required to fulfill the specified sequence of operation.
l. Dynamic graphical presentation for each equipment DDC module and a floor plan.

11. BMS Alarm Conditions:
The BMS shall indicate, as a minimum, the following alarm conditions to the District facility management system:
    1. Low or high space temperature (each program zone)

12. DDC control functions, status points, and data points:
    a. Water Source Heat Pumps (WSHP)
    Each heat pump shall be controlled from an application specific controller (ASC) with the following functions:
        1) Individually addressable from the main Building Management module.
        2) Room temperature set point adjustment from the room sensor or host computer, with assigned authority and with adjustable dead band and throttling range.
        3) Fan on-auto control.
        4) Automatic heat-cool changeover.
        5) Indicate status to the host computer.
            a. room temperature

b. heat/cool mode of operation
c. dehumidification mode (where applicable)
d. Room RH (where applicable)
e. Filter delta P
f. Supply air temperature

6) Multi-stage cooling control for units with multiple compressors.
7) Each heat pump shall have a remote sensor with override button and set point adjustment.

b. Ductless Split Heat Pump Systems:
1) Space temperature (where indicated on the schedule)
2) Error code output (where indicated on the schedule.)
3) Enable/disable status.

I. Program Control:
The building's HVAC equipment shall be programmed to start and stop with the time clock function of the BMS.

New units shall be added to the existing building zone groups. Coordinate zone grouping and scheduling with owner.

All zones shall have a low limit and hi limit sensing to overcall the time clock scheduling.

Any one A/C unit may be energized from the override button on its associated room temperature sensor. The sensor override button shall allow the unit to run for one (1) hour (adjustable). The timed overcall switches shall allow overcalling an entire zone for any time up to 3 hours.

J. Sequence of Operation:
1. Water Source Heat Pumps (WSHP):
a. Each heat pump shall have a factory program relay. A DDC control module shall cycle the heat pump's compressor as required to maintain set point. The heating/cooling mode shall be automatically selected by the thermostat and the refrigerant reversing valve shall be positioned accordingly. Multi-compressor units shall have heating and cooling brought in stages.

Each heat pump shall have a time delay control circuit relay energized by the central time clock for automatically starting and stopping the unit.

Each unit's water regulating valve shall cycle open or close in unison with compressor start/stop cycle. The water control valve shall have an end switch to prove the valve opens before the compressor starts.

Each heat pump shall have a factory mounted drain pan, float safety switch.

Units shall be controlled with a DDC stand-alone module. Multiple units shall be staged, with heat and cooling compressors staged on in 1^0F increments, and 1^0F dead band between heating /cooling changeover. Controller shall have fan "on-auto" selection.

b. Warm-up Outdoor Air Damper Control: Heat pump units with a direct fresh air connection shall have a motorized outdoor air damper. A warm-up thermostat with the bulb located in return air shall not allow the damper to open until the return air temperature warms up to room setpoint.

c. Low & Hi Limit Control:
Each heat pump's sensor shall overcall its associated time clock circuit as required to maintain a minimum/maximum space temperature of 55^0F heating/80^0F cooling. The limit control shall have a 5^0F differential.

d. Minimum Outdoor Air Damper Control: (For units with direct ventilation air connections):
With the unit started, the outdoor air damper shall come under the control of the CO_2 sensor and a mixed air low limit temperature sensor. The CO_2 sensor shall be set to maintain a 1000 ppm. A 0-10VDC or 4-20 MA output signal shall proportion the percent open of O.A. damper from closed at 1000 ppm to fully open at 1200 ppm.

e. Dehumidification (for units with hot gas reheat): Where indicated in Heat Pump schedule, the units shall have dehumidification mode of operation and on an indication of high relative humidity shall energize a hot gas reheat valve and cooling mode to dehumidify the air stream.

f. Condensate pump interlock: For units with drains discharging into condensate pumps, interlock the condensate pump safety switch with its associated WSHP unit or units to shut the unit(s) down upon sensing high water. See HVAC piping plans for units draining to condensate pumps. Some condensate pumps serve multiple WSHP units.

g. Existing WSHP-6 and WSHP-7 Only:
Modify the existing control sequence for these (2) units to prevent one unit from being in heating while the other is in cooling.

2. Ductless Split System (DX):
Mount the units' controls and provide all necessary interlock wiring between the indoor and outdoor units. Where indicated on the schedule, provide a temperature sensor to provide an alarm to the BMS when the temperature exceeds 78^0F (adjustable.)

For units with fresh air connections, motorized outdoor air damper shall be interlocked with unit controls to only open when the compressors are energized.

Where units are indicated on the schedule to have controller for enable/disable input and error output, BMS shall interlock the unit operation with the time clock function of the adjacent area. BMS shall send alarm upon error signal from unit.

TESTING, ADJUSTING, AND BALANCING:
HVAC system testing, adjusting and balancing shall be performed by an independent contractor which specializes in this work. The services required shall include:

1. verification of the performance of all equipment and automatic controls;

2. adjusting and balancing to design quantities of all air and water systems;

3. electrical power readings;

4. recording and reporting all results;

5. Field inspection during the construction phase to insure that balancing valves and dampers are installed where indicated.

6. Provide copies of all T & B site visit Deficiency Reports to the Engineer of Record at the time the report is generated.

Before final acceptance of the building, the balancing contractor shall submit to the Architect/Engineer a bound report of the balancing work containing at least the following items:

1. Schematic diagrams of the A/C systems with the balancing data keyed to the Equipment Data Sheets.

2. Equipment Data Sheets: These records shall be typewritten and submitted on AABC, or SMACNA standard forms. Recorded data shall include at least the following:
   a. Air Systems:
      1. Fan designation, manufacturer, size
      2. Actual and full load nameplate amps (at each terminal for 3 phase units)
      3. Actual and specified fan RPM (or fan speed for variable speed motors.)
      4. Actual and specified total system static pressure
      5. Actual air differential pressure across filters, heating coils, and cooling coils
      6. Actual and specified total system air quantities for supply, return, exhaust, and outside air
      7. Actual and specified air quantities at each terminal: supply, exhaust, and return
      8. Nominal motor H.P., voltage, amp rating, motor overloads size
      9. Fan and drive sheave model no. and make
      10. VFD set point for design air flow
      11. Actual and specified air conditions entering and leaving the heat exchanger coils and heat recovery wheels, for heating and cooling, dehumidification, and hot gas reheat modes
      12. Unit discharge db/wb air temperature in cooling, heating, and dehumdification mode.
      13. Heat pumps shall have the delta T's measured for the DX refrigerant coils in the heating, cooling, and hot gas reheat modes. Resistance heat delta T's shall be measured separately.
      14. Actual and specified kw & delta T's at each electric resistance coil
      15. Furnish a schematic system diagram for each system and indicate on this sketch, the point of all pressure sensings and duct traverses.
      16. 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.
      17. Confirm operation of each needlepoint ionization module by testing ion count 5' above room floor after device (and associated unit) has been running for minimum 5 minutes. Rooms with ion levels below 800 ions/cc may require re-evaluation/retesting. T&B contractor may use owner's ion counter, provided it is returned to the owner in "like new" condition and is fully calibrated.

      Note: 1) Total system air quantities for units 5 ton and larger shall be measured by a duct pitot traverse and not by summation of all terminal air quantities. (Provide duct traverse velocity profile report with T & B report.)
      2) Total system air quantities for units less than 5 tons may be documented by summation of the air terminal quantities.

   b. Water System:

1. Entering and leaving temperature across heat pump condenser. Actual and specified pressure changes across each heat pump auto-flow valve
2. Pump designation, manufacturer, impeller size, nominal H.P., voltage, amp rating.
3. Pump actual operating amps and pressure differential.
4. Flow rates for all calibrated orifice flow measuring devices and their associated set points.
5. For pumps provided with variable frequency drives or EC motors, set supply balancing valve to full open position and set maximum motor speed to achieve design flow rate. Submit motor speed.

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 heat pump 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

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 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